This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

437947

ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
TUEBOR

LB
675
B42
C51

CHRESTOMATHIA.

CHRESTOMATHIA:

BEING

A COLLECTION OF PAPERS,

EXPLANATORY OF

49216

THE DESIGN OF AN INSTITUTION,

PROPOSED TO BE SET ON FOOT,

UNDER THE NAME OF

The Chrestomathic Day School,

OR

CHRESTOMATHIC SCHOOL,

FOR THE

EXTENSION OF THE NEW SYSTEM OF INSTRUCTION

TO THE

HIGHER BRANCHES OF LEARNING,

FOR THE USE OF THE MIDDLING AND HIGHER RANKS IN LIFE.

By JEREMY BENTHAM, ESQ.

LONDON:

PRINTED FOR MESSRS. PAYNE AND FOSS, PALL-MALL;
AND R. HUNTER, ST. PAUL'S CHURCH-YARD.

BY J. M'CREERY, BLACK-HORSE-COURT, FLEET-STREET.

1816.

LB
675
E4
C51

PREFACE.

From the determination to employ the requisite mental labour, in addition to the requisite pecuniary means, in the endeavour to apply the newly invented system of instruction, to the ulterior branches of useful Learning, followed the necessity of framing a scheme of instruction, for the School, in which it was proposed that the experiment should be made.

From the necessity of framing this scheme, followed the necessity of making a selection among the various branches of learning,—art-and-science-learning, as well as language-learning included.

From the necessity of making this selec-

that, on the part of the proposed Conductors, howsoever it may be in regard to ability, neither zeal nor industry are wanting: and that, having undertaken for the applying; to this, in some respects superior purpose, according to the best of their ability, the powers of the newly invented and so universally approved intellectual machine,—their eyes, their hearts, and their hands, will continue open, to every suggestion, that shall afford a prospect, of being in any way contributory, to so universally desirable an effect.

In regard to such part of Table II. as regards the PRINCIPLES of the *New Instruction System*, though of the *matter* itself, no part worth mentioning belongs to the author of the other parts, nor to any person other than those benefactors of mankind, whose title to it stands acknowledged by a perpetual chain of references—yet,—in respect of the *arrangement*, which is altogether new, and the compression, which is studiously close,—such is the convenience, which, it is hoped, will

CHRESTOMATHIA.

SECOND PREFACE.

In the Table of Contents, to wit in that part of it which regards the Appendix, the number of articles mentioned will be observed to be ten. Of these no more than four can at the present conjuncture be delivered. They have, however, been all of them written at least once over: and the fifth, which is longer than all the following ones put together, is completed for the press, and wants not much of being all printed. The rest, to fit them for the press, want nothing but to be revised. How long, or how short soever, may be the portion of time still requisite for giving com-

pletion to the work, the purpose for which it was written admitted not ulterior delay, in the publication of such part of it as was in readiness. With reference to the main purpose, it may, however, without any very material misconception, be considered as complete. In what is now made public will be found every thing that can be considered as effectual to the developement of the plan of instruction. What remains is little more than what seemed necessary to give expression to a few ideas of the author's own, relative to the subjects which will be found mentioned: ideas, so far as he knows, peculiar to himself, and which had presented themselves as affording a hope of their giving, in different ways, more or less additional facility to the accomplishment of the useful purposes in view.

Time enough for their taking their chance for helping to recommend the plan, to the notice of such persons to whom, in the hope of

obtaining their pecuniary assistance, the plan will come to be submitted, it has not been possible for him to get it in readiness: but, from the general intimation given of the topics in the Table of Contents, may be seen what is in view; and from the *first Preface*, together with what has just been said in this *second*, what progress has been made in it. Whatsoever assistance it may be found capable of contributing towards the accomplishment of the general object, thus much the reader may be assured of, viz. that, if life and faculties continue, every thing that has thus been announced will be before the public in a few months, and long enough before the course of instruction can have placed any of its scholars in a condition to reap any benefit that may be found derivable from it.

Of this Appendix, No. I. is occupied by a paper there styled *Chrestomathic Proposal*. In concert with the public-spirited men, with whom the idea of the enterprize had origi-

nated, it was drawn up, at a time when it was thought that, by the circulation of that paper, such a conception of the plan might be afforded as might be sufficient for the obtaining such assistance as, either from pecuniary contributions, or from additional managing hands, should be found requisite. After the paper was printed in the form and in the place in which it will be seen, intervening incidents, and ulterior consideration, having suggested various particulars, as being requisite,—some to be added, others to be substituted,—the task of drawing up a paper for this purpose, was undertaken by other hands. It will be seen, however, that *the plan of instruction* referred to being exactly the same, what difference there is turns upon no other point than some of those which relate to the *plan of management:* and even of these matters, as contained in the more recent paper in question, several will, it is believed, be found to receive more or less of explanation from the anterior paper, which,

as above, will be seen reprinted in these pages.

On the length of the interval,—which, between the printing of the *Preface*, and the sending to the press this Supplement to it, has elapsed,—the author, though he has the satisfaction of thinking the commencement of the enterprize has not been retarded by it, cannot, on his own account reflect without regret, nor altogether without shame. Under this pressure, his good fortune has, however, as will presently be seen, brought to him a consolation, superior to every thing to which his hopes could have raised themselves.

The delay in question has had for its source the paper which, in the Contents of the Appendix to this tract, will be seen distinguished by No. V., and to which, at the top of each page, for a running title, the words, *On Nomenclature and Classification*, or

On the Construction of Encyclopedical Trees—had been destined, but came too late to be employed. Of the number of sections which it contains, all but the 12th had been completed for the press, and all down to the 12th exclusive been delivered from the press,—when, from a recent publication, a passage, of which what follows is a reprint, was put into the author's hands.

In it the reader will observe—and from an official hand of the first celebrity—a *certificate of difficulty*—indeed of something *more* than *difficulty*,—applied to the very work, of which, in and by this same 12th section, the execution has been attempted. It will be found, in Volume I. of the Appendix to the new Edition, termed, on the cover, the 4th and 5th, of the *Edinburgh Encyclopedia Britannica:* date on the cover, December, 1815. It commences at the very commencement of the Preface, which has for its title, "PREFACE "*to the* FIRST DISSERTATION, *containing some*

" *critical remarks on the Discourse prefixed to*
" *the French Encyclopedie.*"

" When I ventured," says Mr. Stewart, " to undertake the task of contributing a " Preliminary Dissertation to these supple- " mental volumes of the *Encyclopædia Bri-* " *tannica,* my original intention was, after " the example of D'Alembert, to have be- " gun with a general survey of the various ' departments of human knowledge. The " outline of such a survey, sketched by the " comprehensive genius of Bacon, together " with the corrections and improvements " suggested by his illustrious disciple, would, " I thought, have rendered it comparatively " easy to adapt their intellectual map to the " present advanced state of the sciences; " while the unrivalled authority, which " their united work has long maintained in " the republic of letters, would, I flattered ' myself, have softened those criticisms " which might be expected to be incurred

" by any similar attempt of a more modern
" hand. On a closer examination, however,
" of their labours, I found myself under
" the necessity of abandoning this design.
" Doubts immediately occurred to me with
" respect to their logical views, and soon
" terminated in a conviction, that these views
" are radically and essentially erroneous.
" Instead, therefore, of endeavouring to
" give additional currency to speculations
" which I conceived to be fundamentally
" unsound, I resolved to avail myself of the
" present opportunity to point out their
" most important defects;—defects which
" I am nevertheless very ready to acknow-
" ledge, it is much more easy to remark than
" to supply. The critical strictures, which
" in the course of this discussion I shall
" have occasion to offer on my predecessors,
" will, at the same time, account for my for-
" bearing to substitute a new map of my
" own, instead of that to which the names
" of Bacon and D'Alembert have lent so

" great and so well-merited a celebrity; and " may perhaps suggest a doubt, whether the " period be yet arrived for hazarding again, " with any reasonable prospect of success, a " repetition of their bold experiment. For " the length to which these strictures are " likely to extend, the only apology I have " to offer is, the peculiar importance of the " questions to which they relate, and the " high authority of the writers whose opi- " nions I presume to controvert."

In the above-mentioned No. V. the experiment thus spoken of will be seen hazarded: and, to help shew the demand for it, a critique on the *Map*, for which *Bacon* found materials and *D'Alembert* the graphical form, precedes it: a critique, penned by one, in whose eyes the most passionate admiration, conceived in early youth, afforded not a reason for suppressing any of the observations of an opposite tendency, which, on a close

examination, have presented themselves to maturer age.

By an odd coincidence, each without the knowledge of the other, the Emeritus Professor and the Author of these pages will be seen occupied in exactly the same task. The one quitted it, the other persevered in it: whether both, or one alone, and which did right, the reader will have to judge. For an experiment, from which no suffering can ensue, unless it be to the *anima vilis*, by which it is made, no apology can be necessary. Having neither time nor eyes, for the reading of any thing but what is of practical necessity, the above passage contains every thing which the Author will have read, in the book from which it is quoted, before the Number in question is received from the press. To some readers—not to speak of instruction—it may perhaps be matter of amusement, to see in what coincident and in what different, points

of view, a field, so vast in its extent, has been presenting itself to two mutually distant pair of eyes,—and in what different manners it has accordingly been laboured in, by two mutually distant pair of hands. To the Author of these pages, in the present state of things, from any such comparison, time for the instruction being past, nothing better than embarrassment could have been the practical result: for the departed philosophers had already called forth from his pen a load already but too heavy for many a reader's patience.

On casting upon the ensuing pages a concluding glance, the eye of the Author cannot but sympathize with that of the reader, in being struck with the singularity of a work, which, from the *running titles* to the pages, appears to consist of nothing but *Notes*. Had the whole together—Text and Notes—been printed in the ordinarily *folded* or *book* form, this singularity would have

been avoided. But in the view taken of the matter by the Author, it being impossible to form any tolerably adequate judgment on, or even conception of, the whole, without the means of carrying the eye, with unlimited velocity, over every part of the field,—and thus at pleasure ringing the changes upon the different orders, in which the several parts were capable of being surveyed and confronted,—hence the presenting them all together upon one and the same plane—or, in one word, *Table-wise*—became in his view a matter of necessity. But the matter of the text being thus treated *Table-wise*, to print it over again in the ordinary form would, it seemed, have been making an unnecessary addition to the bulk of the work. Hence it is that, while the *Notes* alone are printed *book-wise*, the *Text*, to which these *Notes* make reference, and without which there can be little expectation of its being intelligible, must be looked for in the *two first* of the Tables which will ac-

company this work—and which, out of a larger number, are the only ones that will accompany this first part of it.

Hence it happens, that, on pain of not extracting any ideas from the characters over which he casts his eye, the reader will find the trouble of spreading open the Tables, as he would so many maps, a necessary one. Even this trouble, slightly as it may be felt under the stimulus of any strongly exciting interest, will,—as is but too well known to the Author, from observation, not to speak of experience,—be but too apt to have the effect of an instrument of exclusion, on those minds, of which there are so many, of which the views extend not beyond the amusement of the moment. But, as above, whatsoever may be the risk attached to the singularity thus hazarded, it has presented itself as an unavoidable one.

Chrestomathia.

CONTENTS.

1. Chrestomathic Instruction Tables.—Table I. Containing *Advantages—Stages of Instruction—Grounds of Priority,* in relation to the branches herein included—*Grounds of Omission,* applied to branches *not* included.

2. Chrestomathic Instruction Tables.—Table II. Containing Application of the PRINCIPLES of the New Instruction System, and of a set of correspondent School-EXERCISES, to the higher branches.

APPENDIX.

No. I. Chrestomathic Proposal.

No. II. Fatal effects of *ennui*—the disease of an *unfurnished* mind—illustrated by an example.—Account of *John Beardmore, Esq.*—From the Obituary of the Monthly Magazine, for April 1, 1814, p. 270.

No. III. Successful Application of the new System to *Language-learning,* in the case of the Great School, called the *High School,* Edinburgh: as reported in a Letter to Mr. Fox, from James Pillans, Esq. Rector of that School. From the Report of the British and Foreign School Society, Anno 1814, p. 57.

No. IV. Ditto in the case of another Class of the same School—Successful application of the New System of Instruction to *Language-learning*, in the case of one of the Classes of the *High School*, Edinburgh, as reported in a letter from Mr. James Gray, Master of the Class, to Edward Wakefield, Esq. 28th Dec. 1813.

No. V. Nomenclature of the main branches of Art and Science —its imperfections—with proposed remedies.

No. VI. Sources of Motion, and correspondent *Primum Mobiles* —a comprehensive sketch, now first attempted.

No. VII. Sketch of the field of Technology.

No. VIII. Hints towards a *System* and *Course* of Technology, from *Bishop Wilkins*'s Logical work, published by the Royal Society, Anno 1668, under the title of *An Essay towards a Real Character, &c.*

No. IX. Divinity, why not comprised in the Scheme of Instruction, proposed to be pursued in the Chrestomathic Day-School.

No. X. New Principles of Instruction, proposed as applicable to *Geometry* and *Algebra*, principally for the purpose of applying, to those *superior* branches of learning, the *Exercises*, already applied with so much success to the *elementary* branches.

from
seful
l em-
ould

ages,
to be
he un-
ion of
ssible
nd of
ll suc-
y such
me, ab-
allotted

. (1.)
opes.]—
fit, in a
ery of a
n: *Pre-*
ciples of

8. (4.) Conception, and love, of *good order;* to whatsoever subject applied: *good order*, the great source of internal *tranquillity*, and instrument of *good management*. *See Stage* V.

9. (5.) Enlargement given to each Scholar's field of *occupation*. The more things he is more or less acquainted with, the more things he is fit for, and the better chance he has acquired of meeting with some *occupation* (pecuniary-profit-yielding or not) according to his *condition*, which shall be at once within his *power*, and suited to his *taste*.

CHRESTOMATHIC TABLES.

TABLE 1.

I.—NOTES TO THE *ADVANTAGES.*

(a.) [*Chrestomathic.*] A WORD, formed from two Greek words, signifying *conducive to useful learning*. After it was framed, it was found employed in a book of the 17th century, and would probably be to be found in other books.

(b.) [*Stages.*] In regard to the several *stages*, into which the proposed course is proposed to be divided, all that, in the present state of the undertaking can be done, is—to give intimation of the *choice*, which, among the several possible subjects of instruction, has been made, and of the *order* in which it is proposed they shall succeed to one another. At this juncture, any such attempt as that of fixing the *quantity of time*, absolute and comparative, respectively to be allotted to them, would evidently be premature.

(1.) For an example, see Appendix, No. (1.)

(2.) [*Groundless fears and delusive hopes.*]—Examples.—*Delusion* 1. *Hopes* of profit, in a mechanical establishment, from discovery of a practically applicable *perpetual motion: Preservative*—Acquaintance with the principles of

mechanics. (See Stage II.)—*Delusion* 2. *Hopes* of profit, from discovery of what has been called the *philosopher's stone:* and thereby that of the art of converting less rare and costly metals into gold: *Preservative*—Acquaintance with the mineralogical branch of chemistry: (See Stage II.) *Delusion* 3. *Hopes* of extravagant profit, from *manures*, the composition of which is kept secret: *Preservative.*—Acquaintance with the *theory of vegetation.* (See Stage III.)—*Delusion* 4. *Hopes* of profit to health, by the use of *medicaments*, or modes of *medical treatment*, to which no such virtue as is believed or pretended to be believed, is attached: as in the case of *animal magnetism*, *tractorism*, &c. &c.; and of medicaments, in vast variety, prepared without sufficient acquaintance with, or attention to, the branches of art and science subservient to *Hygiantics: Preservative* — Acquaintance with those several branches of art and science. (See Stage IV.) *Delusion* 5. *Hopes* and *fears*, derived from a supposed connexion, between the distant celestial bodies on the one part, and the well- or ill-being, of particular individuals among mankind, on the other part: *Preservative* — Acquaintance with *Uranology*, more frequently termed *Astronomy.* (See Stage V.) 6. *Fears*, derived from the opinion of the existence—and occasional operation or appearance—of *Ghosts*, *Vampires*, *Visible Devils*, *Witches*, and unembo-

died beings, of various sorts, actuated by the desire, and endued with the power, of doing mischief to mankind: *Preservative*—On the one hand, acquaintance with *Natural Philosophy* in general (see Stages II. III. IV. V.) i. e. with the means by which, and the manner in which, effects beneficial and pernicious to mankind are really produced: on the other hand, in the nature of *human testimony*, in the imperfections of which, delusive notions sometimes find their *channel*, and sometimes have had their *source:* in that propensity to be deceived, which is in the inverse ratio of the progress of true knowledge, and of that propensity to deceive others, which is in the inverse ratio of the progress of true morality:—of these propensities, it is by *History* and *Biography* that the exemplifications, and thence the proofs, are furnished. In so far as it is from *Natural Philosophy*, that the preservative is derived, it belongs beyond doubt to the *Chrestomathic* course: in so far as it is from the principles of *Evidence*, and thence from *History* and *Biography*, the investigation and application of the remedy will, probably, according to general opinion, be regarded as belonging to a maturer and self-instructing time of life. For, on this head, the correctness, of whatsoever notions may come to be entertained, will depend—not, as in the case of *Natural Philosophy*, in a principal measure on the *senses* and the *memory*, but in a much greater

degree upon the *judgment* or *judicial faculty;* and *that* too, acting in each instance, under the necessity of including, in the grounds of its decisions, collections of particulars, ample in extent, multitude, and variety, taken conjunctly into consideration, after having been brought all together into comparison for the purpose.

(3.) [*Natural Pleasantness.*] At the dawn of reason more especially, an object is the more *pleasant*, the more exclusively it presents itself to *the senses*, especially to the senses of *sight* and *hearing;* and, accordingly, the less forcibly it applies itself to the *understanding*, calling for the exercise of the *judgment*, on an extensive scale. Hence the various *sensible forms*, presented by *nature* and *art*, particularly by *nature*, are objects which, at this early period, present in general a stronger interest than is presented by *transactions*, such as are produced by the mutual intercourse amongst persons of mature age: objects of natural, or as it is called *physical*, than is presented by objects of *moral*, including *political*, knowledge. *Birds* and *Beasts* (subjects of *Zoology*) are, by themselves or their images, plane or solid, among the most pleasant and interesting objects, that can be presented to the observation of children at their earliest ages.

(4.) [*Artificial Pleasantness.*] Under the new mode of instruction, a sort of pleasantness, not the less real for being *artificial*, i. e. for being the

product of reflection and ingenuity, is imparted to all subjects:—not excepted the most abstruse ones. But, this being the same on all *occasions*, and to whatsoever *subjects* applied, the *natural* degree of pleasantness or unpleasantness will remain to each unaltered.

(5.) [*Corporeal—Incorporeal.*] *Corporeal*, or *bodily:* viz. *natural* substances, such as *stones*, *plants*, and *animals: artificial* substances, such as *buildings*, *furniture*, *cloathing*, *tools*, articles of *food* and *drink;* and the *materials*, wrought or unwrought, *of* which, and the *tools* and other *instruments with* which, they are respectively composed: —*Incorporeal;* such as, *interest* of money lent, *rents* issuing out of land, and other similar subjects of property; political *offices*, *conditions in life*, resulting from *genealogical* relations; such as those between *husband* and *wife*, *father* and *child*, *guardian* and *ward*, *master* and *servant*.

(6.) [*Concrete.*] From a Latin word, which signifies *grown up along with;* viz. along with the subject which is in question, whatever it be: it is used in contradistinction to the word *abstract*, derived from a Latin word, which signifies *drawn off from:* viz. from the subject in question, as above. An *orange*, for example, has a certain *figure*, whereby, in connexion with a certain *colour*, it stands distinguished from all other fruits, as well as from all objects of all sorts. Take into consideration this or that *individual*

orange, the ideas presented by the *figure* and *colour*, whereby it stands distinguished not only from other fruits, but even from other *oranges*—from other fruits of the same kind—are *concrete* ideas: for, they *grew up*, as it were, together in the mind, out of the individual object, by which they are excited and produced: they are amongst the *elements*, out of which the aggregate conception, afforded and presentible to us by that individual object, is formed. The orange being no longer in sight,—now, of the figure and colour observed in that individual orange, consider such parts or appearances as are to be found (as it appears) in all *other* oranges, as well as in *that* one. The idea thus formed is *an abstract idea:* it being a portion *drawn off*, as it were, from the *aggregate idea* obtained, as above, from the *individual object*. Being abstracted and slipt off from the individual stock, and thereupon planted in the mind, it has there taken root, and acquired a separate and independent existence. Without thinking any more of that individual orange in particular, or of oranges in general, or of so much as of *fruits* in general, take now into consideration *figure* at large, and *colour* at large: Here, at one jump, the mind has arrived at an idea, not only *abstract*, but vastly *more* abstract than in the case last mentioned. Instead of *figure* and *colour*, let us now say *sensible qualities*. Under this appellation are included not only *figure* and *colour*, but

smell, *taste*, and many others: it is therefore *abstract* in a still *higher* degree.

(7.) [*Complex or complicated.*] Understand, with the exception of that species of *complexity* or *complicatedness*, which has place in the case of *concrete*, as contradistinguished from *abstract*, ideas. Whence (it may be said) comes this exception? Answer—from hence; viz. that though, in other cases, the more complex the idea is, the greater the labour of mind or force of attention is, which is necessary to the obtaining the conception in a clear and correct state, *that* is not the case here. No portion of matter ever presents itself to *sense*, without presenting, at one and the same time, a multitude of *simple* ideas, of all which taken together, the *concrete* one, in a state more or less correct and complete, is composed. At the same time, though naturally all these ideas present themselves together, the mind has it in its power to detach, as above, any one or more of them from the rest, and either keep it in view in this detached state, or make it up into a compound with other simple ideas, detached in like manner from other sources. But, for the making of this separation—this abstraction, as it is called—more *trouble*—a stronger force of *attention*—is necessary, than for the taking them up, in a promiscuous bundle, as it were—in the bundle in which they have been tied together by the hand of Nature:

that is, than for the consideration of the object in its *concrete* state.

(8.) [*Cause and effect.*] On all these accounts, but especially the last, the juvenile mind will be earlier prepared, for the reception of instruction, with reference to *Natural History*, (Stage I.), than to *Natural Philosophy*, (Stages II. III. IV. V.): and, as between these,—forasmuch as, in each of these stages, the subjects included in it add more or less—if not to the *extent*, to the *number*, and *variety*, of those included in the preceding stage or stages,—it will be better prepared, for the branches, contained in Stage II. alone, than for those contained in *that* and Stage III. together; and so on as to the rest.

(9.) [*Name of the Art or Science.*] A cloud of perplexity, raised by indistinct and erroneous conceptions—a cloud of perplexity, and consequent difficulty of expression—seems to have been, at all times, hanging over the import of the terms *art* and *science*. A few lines, it is hoped, will not be found altogether unemployed in the endeavour to dispel it.

The common supposition seems to be—that, in the whole *field of thought* and *action*, a determinate number of existing compartments are assignable,—marked out all round, and distinguished from one another, by so many sets of natural and determinate boundary lines: compartments, where-

of some are filled, each of them by an *art*, without any mixture of science; others, by a *science*, without any mixture of *art:* others, again so constituted that, as it has not ever happened to them hitherto, so neither can it ever happen to them in future, to contain in them any thing *either* of art *or* science.—On some such supposition accordingly, appear to be grounded questions such as the following:—*how many arts* are there? how many *sciences?*—such a *thing*, (naming it) is it *an art*, or is it *a science?*—i. e. such a *word*, (mentioning it) is it the *name* of *an art*, or is it the name of a *science?*

This supposition will, it is believed, be found in every part erroneous. As between *art* and *science*, in the whole field of *thought* and *action*, no one spot will be found belonging to either, to the exclusion of the other. In whatsoever spot a portion of either is found, a portion of the other may be seen likewise. Whatsoever spot is occupied by either, is occupied by both: it is occupied by them in *joint-tenancy*. Whatsoever spot is thus occupied, is so much taken out of *the waste:* but neither is there any determinate part of the whole waste, that is not liable to be thus occupied.

Practice, in proportion as *attention* and *exertion* are regarded as necessary to due *performance*, is termed *art: knowledge*, in proportion as

attention and *exertion* are regarded as necessary to *attainment*, is termed *science*.

In the Latin language, *both* are with great advantage comprehended under one common appellation, viz. *disciplinæ*, from *disco* to learn: *disciplinæ*, with which our English word *discipline* agrees in sound as well as in derivation; but, by the narrower import which has been attached to it, may probably be regarded as having been rendered unfit for this use.

In the very nature of the case, they will be found so combined as to be inseparable. Man cannot *do* any thing well, but in proportion as he *knows* how to *do* it: he cannot, in consequence of *attention* and *exertion*, *know* any thing, but in proportion as he has practised the *art* of *learning* it. Correspondent therefore to every *art*, there is at least one branch of *science:* correspondent to every branch of *science*, there is at least one branch of art. No determinate line of distinction between *art* on the one hand, and science on the other: no determinate line of distinction between *art* and *science* on the one hand, and *unartificial practice* and *unscientific knowledge* on the other. In proportion as that which is seen to be *done* is more conspicuous than that which is seen or supposed to be *known*, that which has place is apt to be considered as the work of *art:* in proportion as that which is seen or supposed to be *known*,

is more conspicuous than any thing else that is seen to be *done*, that which has place is apt to be set down to the account of *science*. Day by day, acting in conjunction, *art* and *science* are gaining upon the above-mentioned waste—the field of *unartificial practice*, and *unscientific knowledge*.

Witness *Electricity*, *Galvanism*, (see Stage II.) *Geognosy* or *Geology*, *Aerostation*, (see Stage III.) *Botanical* and *Zoological Palæology* (knowledge regarding the remains of plants and animals deposited, according to appearance, at remote times in the bowels of the earth) a branch of science appertaining in common to *Botany* and *Zoology* (see Stage I.) on the one hand, and *Geognosy* (see Stage III.) on the other. Under an *old name*, even *Chemistry* (see Stage II.) includes an immense mass of art and science, all *new* within these few years. Of late years, *Nephelognosy* (if by this appellation may be designated the long chain of partial observations, which have recently taken the *clouds* for their subject) has become a candidate for existence. So, in the department of *morals* and *politics*, *Statistics:* a newly cultivated branch of *Geography*, having for its subject the quantities and qualities of the matter of *population*, of the matter of *wealth*, and of the matter of *political strength*,—existing or supposed to exist, on the *territory*, or in the *political state*, to which it applies.

While new branches of art and science have

thus been starting up, and putting themselves upon the list, others have dropped out of it: the case being, that, either on the one hand something, which had been supposed to be *done*, has been found *not* to have been done, nor to be, for any thing that appears, *capable* of being done; or, on the other hand, that something which had been supposed to be capable of being *known*, has been found, according to all appearance, destitute of existence, and on that account not capable of being known.

Witness *Alchemy*, or the art of transmuting other metals into gold: with or without the art of composing a medicine, fit for the cure of all sorts of disorders whatsoever: those of the most opposite nature not excepted. 2. *Astrology*, or the art of discovering future events, affecting the prosperity of individual inhabitants of the earth, by looking at the stars. 3. *Necromancy*, the art of discovering future events by conversing with the dead: to which may be added a cluster of other arts or sciences, all ending in *mancy*, and having for their objects the deriving knowledge concerning future events, from so many different sources, from no one of which is any such knowledge to be obtained.

As between *art* and *science*, in so far as they are distinguishable, *art* is that one of the two that seems entitled to the first mention, as being first and most independent—in *value*, and thence in

dignity, in so far as dignity consists in *use:* for, of *science*, the value consists in its subserviency to *art;* of *speculation*, the value consists in its subserviency to *practice*. Of the two, *art*, when it is not itself the *end*, stands nearest to the end: with reference to this end, whatsoever of *science* stands connected with it, is but as a *means*. But if, independently of all connexion which it has with *art*, *science pleases*, then, in so far as it pleases, it is *of use:* for *use* itself has neither *value* nor *meaning*, but in virtue of, and in proportion to, whatsoever relation it has to *pain* or *pleasure*.*

(10.) [*Antiquity*.] Between the degree of *natural preparedness*, on the part of the mind, for the reception of a branch of instruction, be it what it may, and the *antiquity* of it, as measured by the length of time that has elapsed, since instruction in it happened first to be administered,—no immediate and necessary connexion can be shewn to have place. *In* time indeed, but not *by* time are things done. *Experience*, *observation*, *experiment* —in these three words may be seen the sources of all our knowledge. Of these, *experience* is without effect, any farther than as it has had *observation* for its accompaniment; and, in the very

* Persons to whom the account thus given of *art* fails of being satisfactory, may find a very different account of it, in *James Harris's* 8vo. volume, intitled "*Three Treatises:*" one of which is, the whole of it, expended upon a definition of this word: without any mention (as far as memory serves) of the word *science*.

idea of *experiment*, that of *observation* is included. Upon *observation* therefore it is—upon *observation*, that is upon *attention* applied to the subject with effect—that every thing depends. Numerous and various are the natural objects, which, when once, by minds matured for the purpose, they have been *observed* and thereupon *denominated*, find the infant mind in a state of the most perfect *preparedness* for their reception; but which never happened to be taken for the subjects of *observation*, nor therefore of *denomination*, till within these few years.

To the infant mind, few objects can be more *interesting*,—none are there, of which the external characters are more *readily* apprehensible,—than those which belong to the field of *animated nature*. But, for the most part, what acquaintance we have with the objects which belong to this part of the field of thought and action, is of very modern date.

(11.) [*Number of teachers and learners.*] A circumstance on which the *antiquity* of a subject of knowledge has *no* influence is, as above, the *natural preparedness* of the juvenile mind for the reception of it. But a circumstance, on which that antiquity has *great* influence is—the *number* of the persons who, at the time in question, are engaged in the *teaching* of it, and thence the number of those who are engaged in the *learning* of it: desire to *learn* on the one part, and desire

to *teach* on the other, being two circumstances which with relation to one another, are both *cause* and *effect*. Cases to a comparatively small extent excepted, (for example, that which has place where the advantage derivable from teaching is made the subject of a monopoly) whatsoever be the real and intrinsic value of a branch of learning, those who *have learnt* it, and those who *are teaching* it, have, each of them, an interest in magnifying it, and causing it to be cultivated to the greatest extent possible: *learners*, as well as *teachers*, lest their labour should be thought to have been bestowed in vain; *teachers*, that the number of their customers may be as great as possible. Among the known subjects of intellectual labour, not many, it is believed, can be pointed out that have less in them of intrinsic use, especially since the stock of *translations* have been compleated, than the *dead* languages. Yet, of these, there are incomparably a greater number of teachers, and thence of learners, than of all other branches of learning put together, the very *elementary* ones, viz. *reading*, *writing*, and arithmetic, alone excepted.—Why? Because the study, of those keys to knowledge, has continued to be cultivated, from the time when, the above-mentioned elementary branches excepted, there was very little known that was worth *learning*, still less for which *teachers* could be found.

(12.) [*Introductory Stage.*] The branches of in-

struction, thus referred to an introductory stage, are the same as those which are comprehended in the course of instruction carried on in that *new method*, which, though applicable with equal advantage to the situation of the *highest*, has not as yet been applied to any other than that of the *lowest*, ranks in life.

In this introductory stage, to a degree more or less considerable, the matter of instruction cannot fail of coinciding with, and thus anticipating upon, the matter here allotted, for the first and earliest, of the five stages *peculiar* to the hereby proposed School. *Words*, for example, it cannot but have to operate upon: and—the words, of which, in the first of these *principal* and *peculiar* stages, the matter of instruction is composed, being such as are adapted to the very earliest age,—of this sort, with at least as much propriety as of any other sort, may be the words employed in the *introductory* stage already in use. Again: *Writing* is among the *Exercises*, allotted to the first Chrestomathic Stage. But *writing* is itself but a mode of *drawing;* nor that the easiest mode. *Geometry* will, among its figures, present some still more simple, than some of the *letters*, of which *written discourse* is composed.

(13.) [*Mineralogy.*] From two words, one of which, derived from the Latin, signifies belonging to *mines* (mines being the places from which the most interesting among the subjects of this branch

of science, are extracted); and a Greek word, which signifies *an account*, or *giving an account of*.—In this first stage, the subject,—in so far as teachable by exhibition of *figure*, *colour*, and other sensible qualities,—will be taught, without reference made, as in *Chemistry* and *Geognosy*, to *causes* and *effects* more or less remote.

(14.) [*Botany*.] From a Greek word, which signifies a *plant* or *vegetable:*—to be taught, as above, without reference to the relation of *cause* and *effect*, except in so far as indication of the manner of *propagation* comes to be made.

(15.) [*Zoology*.] From two Greek words, one of which signifies an *animal*, the other *an account*, as above:—to be taught as above.

Under *Mineralogy*, will be presented to view those bodies and portions of matter, in which *no* sort of life is found: under *Botany*, those which have *vegetable* life, i. e. *birth* and *growth*, as well as *death*, but, as far as appears, without *feeling:* under *Zoology*, those which have *animal* life; i. e. not only, as plants, *birth*, *growth*, and *death*, but *feeling*, as far as appears, with more or less of *thought*. On these subjects, the *Exercises*, prescribed and performed, will, as far as circumstances admit, be accompanied with the *exhibition* of *specimens;* specimens, *dead* and even *living:* as well as *draughts* or *models* of specimens. See Table II. Col. 1-3.

(16.) [*Geography*.] From two Greek words;

one of which signifies *the earth*, the other *delineation* or *description:* the *familiar* or *purely geographical* branch; viz. that, for the teaching of which, *maps*, with the requisite verbal explanations, are sufficient: dismissing to Stage V. 4. the *scientific:* viz. that by which are exhibited the facts and appearances, resulting from the connexion which the earth has with the *sun*, the *moon*, and other parts of the universe visible to our eyes.

(17.) [*Geometry.*] From two Greek words; one of which, as above, signifies the *earth*, the other *measurement*. From this derivation it appears, that, among the Greeks, the first application, which this branch of art and science received, was—that of being employed in measuring, for the purpose of ascertaining ownership, portions of the *earth's surface:* such as Fields, Gardens, and the sites of Houses. But it is now applied to portions of apparently void *space*, as well as to *bodies* of all sorts and sizes, imaginary as well as real, in so far as considered with a view to nothing but their *figure*.

From this stage, the *demonstrations*,—as requiring too *many* objects, and those not in themselves interesting, to be held at the same time in the *memory*, and too strong a *hold* to be taken of them by the *attention*, for the purpose of forming a ground for the *judgment*,—will be dismissed to Stage V. and last. So likewise even the *enunciative* parts of the *propositions:* except perhaps in

the instance of a few of the most simple and easily conceived. Remain the *definitions;* for the illustration of which, the most familiar specimens, such as *rules, pencils, slates, marbles, balls, tops,* &c. will be employed. As to the *demonstrations,* from the proposed postponement, no real inconvenience can, it is presumed, result. On no other subject, with so little danger of error as on that of geometry, can propositions be delivered to be taken upon trust. Be the art or science what it may,—incompetence, as to the reception of *some* particulars belonging to it, affords no reason for withholding from the juvenile mind, any *other* particulars, to the reception of which it is competent.

(18.) [*Historical Chronology.*] *Historical,* from a Greek word, which signifies originally *knowledge* at large; but which, in the use commonly made of it, is at present confined to knowledge, or supposed knowledge, relative *to past events:* principally to such as are of a political nature; such as *wars, conquests, changes of government,* &c.—*Chronology,* from two Greek words; one of which signifies *time,* the other an *account,* as above. *Historical Chronology:* i. e. *History* in so far as exhibited by *Chronology,* considered in no other than the *familiar* point of view: consisting of indications given, of the principal events, known or supposed to have happened to mankind,—mentioned, in the briefest manner, with re-

ference to the portions of time, in which they are respectively supposed to have taken place: the mention so made not being accompanied by any of those statements or observations, relative to their supposed *causes* or *effects*, or relative to the characters of the respective actors, whereof the matter of what is generally meant by the word *History*, is composed. History, thus as it were *cloathed*, will be reserved—partly for a higher *stage* in this same school, partly for a maturer *time of life*. For another branch of *Chronology*, which stands higher, and belongs to *Natural Philosophy*, see Stage V. 5.

By the difference between *to day*, *yesterday*, and *the day before*,—application being made of the *numeration table*,—a child, at its very exit from infancy, will have been found prepared for *Historical Chronology*, as above described: the import, attached to the words designative of the several events, becoming by degrees more and more clear, correct, and complete, as the course of instruction advances.

Exercises in Historical Chronology will be afforded by *Tables*, *Charts*, and *Memoriter verses*; and, in return to correspondent *questions*, *Answers* written and repeated in prose.

(19.) [*Biographical Chronology*.] *Biographical*, from two Greek words; one of which signifies *life*, the other a delineation or *description*, as above. In this instance, as in that of *Historical*

Chronology, the miscellaneous matter will for some time be dismissed, as above. *Exercises*, much the same.

(20.) [*Appropriate Drawing.*] *Appropriate*, viz. correspondent—on the one hand, to the state of the *bodily faculties*, and the degree of *proficiency* thence attained,—on the other hand, to the particular nature of the branch of *art* and *science* to which, in the character of an *organic test of intellection* (See Tab. II. Col. I. 4, 9.) application is made of this art.

At to *earliness*,—the first rude essays in *drawing* cannot take place *too soon*. *Writing* is but a particular branch or application of it. Not to speak of *mineralogy*, with the right lined angles exhibited by its *chrystals*,—and even *Botany* and *Zoology*, as exhibited by some of their outlines,—*Geometry* affords forms, still more easily traceable upon *sand* or *slate*, than those which are produced by *writing*, under the name of *letters* and *words*.

Of the term *appropriate drawing*, the import will consequently be *shifting* at every successive stage: the *figures* delineated being, throughout, such as appertain to the branches of learning, included in the Stage in question, as well as the preceding ones.

By the several Branches of *Natural History-learning*, comprised in *this* Stage, is furnished the *matter*, upon which the juvenile mind will have to

operate, in the course of the several *succeeding* stages. The more familiarly it has become acquainted with them, when presented in this most simple point of view, the less the difficulty it will experience, in its endeavours to comprehend the *propositions*, of which they will be taken for the *subjects*, in the course of the succeeding stages.

By the hands of *Chemistry*, the *inward* constitution and composition—the *latent* properties—of all those several *natural* modifications of matter, will, principally by means of *mixture* and different doses of combined and uncombined *caloric*, (different degrees of heat and cold) be laid open and brought to view.

(21.) [*Mechanics in the limited sense of the word.*] *Mechanics* from a Greek word, which signifies a *machine*, an *engine*, a *contrivance*. In the *limited sense of the word*; viz. in the sense in which it is employed for the designation of the several distinguishable classes of configurations, contrived principally for the purpose of gaining *force* at the expense of *dispatch*, or *dispatch* at the expense of *force*. These are, 1. the *lever:* 2. the wheel, turning upon a fixed axis: 3. the *pulley*, or *shifting wheel:* 4. the *inclined plane:* 5. the *screw:* 6. the *wedge:* to which hath of late years been added, 7. the *funicular machine;* and are now designated by the common appellation of *the mechanical powers*. This *limited* sense is the only

original one: the only one attached to the word, in the language from which it is derived.

Within the last two hundred years, the species of *force*, to a compromise as it were amongst which, all distinguishable bodies or masses of *matter* appear to be indebted, for the *quantity* of *matter*, the *form*, and the *texture* which they respectively possess, have been brought to light. These are, 1. *Attraction of gravity*—a tendency possessed, not only by all the matter of which our *earth*, but by all the matter of which any part of the visible *universe*, is composed. 2. Attraction of *cohesion*, the perceptible operation of which is confined within distances too small to be distinguished by human sense. 3. *Elasticity:* i. e. a principle of *repulsion* corresponding to, and antagonizing with, the attraction of *cohesion:* 4. Attraction and repulsion, having place in the case of *Magnetism*. 5. Attraction and repulsion, having place in the case of *Electricity*. 6. Attraction and repulsion having place in the case of *Galvanism*. 7. Attraction, termed *elective*, belonging to the province of chemistry, and, from the French, commonly, though rather unhappily, expressed by the term *chemical affinity*. N. B. in regard to these *three* or *four* last species, it seems not at present, altogether determined, how far they coincide, and how far, if at all, they stand distinguished from each other.

To the head of *Mechanics*, taken at *large*, (in-

cluding or not including *Mechanics*, taken in the *limited* acceptation of the word, as above) seems now to be generally referred what appertains to the three first of the above seven general principles, together with whatsoever changes or arrangements, are regarded as capable of being brought about, or secured, in any mass or masses of matter, without any such change in the arrangement of their undistinguishably minute constituent elements, and thence in some of their external characters, as those, which it belongs to the *Chemist*, as such, to produce or bring to view. In regard to *Magnetism* and *Electricity*, in so far as the motions, which have place on the occasions on which those words are employed, are seen to extend to *measurable* distances, they seem to be considered as belonging to the head of *Mechanics:* in so far as the distance in question is so minute as to be *incapable* of *measurement*, they seem to be considered as belonging to the head of *Chemistry*.

By all the several instruments, above spoken of under the head of *mechanical powers*, motion is *transferred* and *modified;* by none of them *produced:*—in all of them motion finds a *channel;* in none of them of a *source*. What then are the several *sources*, from which, for any purpose, and in particular for purposes of practical utility, it is producible, and accordingly produced? More shortly, what are the several *sources of motion*,

and what the corresponding *prime movers*, or *primum mobiles?* Of a search, made in the latest and most approved institutional works on Natural Philosophy, the result has been—that of no such topic, is any the slightest mention to be found: and thus *a gap*, the existence of which had long been matter of observation, and never without astonishment—a gap in the very heart of the science—was found to remain still unfilled up.

That, in the Chrestomathic School, a demand so urgent may not be altogether unprovided with an answer, a slight sketch on this subject has been attempted, and is inserted in the *Appendix:*—in the hope, and under the assurance, that, being thus started, the subject will not remain long, without being more effectually pursued by more competent hands.

(22.) [*Hydrostatics.*] From two Greek words: one of which signifies *water;* the other, taking a *station, position*, or *level.*

To this head belong such of the *mechanical* properties of the portions of matter of which our earth is composed, as are the result of the propensity, which, in conformity to the all-pervading principle of *gravitation*, the component particles of water, and all other bodies, in so far as they are in a state of *fluidity*, have to range themselves in such a manner as to form a surface, which to our eye appears *flat*, but which is in fact a *curve*, having its central point in this our planet.

On this property depend the means employed for ascertaining the *specific gravity* of different bodies: i. e. the *different weights* respectively possessed by the *same bulk* of each; and in particular the *weights*, and thence the *values*, of *spirituous* and other costly liquors: so likewise, in a considerable degree, the effects of *pump-work;*—of *mill-work;*—more particularly in the case of *water-mills:* and the efficiency of such solid constructions as are employed in resisting the *pressure* of the *water:* for example, navigable vessels, wharfs, docks, &c.

(23.) [*Hydraulics.*] From two Greek words: one of which, as above, signifies *water;* the other, a *pipe* or *tube.*

To this head belong the *mechanical* properties of liquids, as above,—in so far as, being bounded by, and confined in, solid channels of a determinate form, the *force* with which, and the *direction* in which, when put in motion, they act, and the *effects* of which, on that occasion, they become productive, are influenced by the internal *form* or *configuration*, of those same channels. It is therefore nothing but a particular branch or modification of *Hydrostatics.* To this belongs, for example, *pump-work* as above, and in general the art of *conveying* water and other liquids, upon a large scale, to places in which they are wanted.

(24.) [*Mechanical Pneumatics.*] *Pneumatics*, from

a Greek word, which means *air*. Coincident with, or at least included in, the import of this term, is that of the recently employed term, *Aërostatics*.

To this head belong those *mechanical* properties, as they are termed, which, in whatsoever different degrees, are possessed in common, by all such portions of matter as, at the time in question, are in the *aërial* or *gasseous* state: and in particular their *weight*, (the result of the *attraction* of *gravity*), their *elasticity*, (the result of the principle of *intestine repulsion*) and that *pressure* on all sides, which is the result of the sort of *compromise*, that has place amongst those *antagonizing forces*.

To the head of *Chemical Pneumatics*, as below, belong those properties, by which the several species of bodies, when in the *gasseous* state, are distinguished from each other.

On the above *mechanical* properties, depend, for example, in a greater or less degree, the art of *mill-work*, in so far as concerns *windmills;* the art of constructing and navigating *navigable vessels*, in so far as *sails* are employed, and, in virtue of the tendency, which the same body, viz. *water*, has to pass from the *liquid* into the *gasseous* state, and back again, according to the quantity of *heat* combined or mixed with it, the construction of *Steam-Engines*.

(25.) [*Acoustics.*] From a Greek word, which signifies *to hear*. To this head belongs the pro-

perty, which, by its motion, *air* has, of producing in the correspondent organs of man and other animals, the perception of *sound*, in the infinitely diversified modifications, of which it is susceptible. On the science thus denominated, depend, for example, in a degree more or less considerable, the art by which relief is afforded in case of *deafness;* and the art, by which *words*, and other *audible* signs are employed in the *communication* of ideas, whether near at hand, or at a distance.

(26.) [*Optics.*] From a Greek word, which signifies *to see.*

To this head belongs the property, which *light* has, of producing in the correspondent organs of man and other animals, the perception of *sight* or *vision:* and thereby rendering in some sort present to them, bodies, which, so far as depends upon all other senses, are separated from them, by vast, untraversable, and even unmeasurable, distances.

On this depends, for example, the art of employing, with effect, *glasses* and other bodies, so prepared, as, in some cases, to *transmit* the light, in others, to *reflect* it: and, by the one means or the other (besides increasing, for the purpose of *chemical* operations, the quantity of *light*, and along with it of *heat*, brought to bear upon a given point) to *delight* the organs of vision, by a variety of *images*, not otherwise perceptible: to afford *relief* to those same organs, under various *imperfections* to which they are subject,—to enable them to obtain per-

ception of objects too *small* to be perceived otherwise, and of others (such as several of the heavenly bodies) which, notwithstanding their vast bulk, are too *distant* to be by any other means effectually perceived or observed;—and, by observations taken of them, to ascertain, upon occasion, with relation to the general surface of the earth, by the help of calculation, the momentary position of a *navigable vessel;* and thus afford *guidance* to it in its course.

(27.) [*Chemistry.*] From an Arabic word, which may be said to be of the same signification, allowance made for the minuteness of the stock of knowledge, possessed in relation to the subject, at the time when the word first came into use, in comparison of the vastness of the stock possessed at present.

To the head of *Chemistry* seem to be generally referred, those properties, which are either discovered in bodies, or given to them, by means of *mixture* (i. e. actual contact, produced as between bodies in a *fluid* state on the one hand, and bodies, either in a *fluid* or in a *solid* state, on the other), or by the application of extraordinary degrees of *temperature*, (i. e. of heat or cold, or both); on which occasions the original bodies are, commonly, in appearance destroyed,—and, in the room of them, new ones—in appearance and properties, more or less dissimilar—produced.

(28.) [*Mineral Chemistry.*] (29.) [*Vegetable Che-*

mistry.] (30.) [*Animal Chemistry*.] i. e. Chemistry, considered in its application to those three different classes of bodies. Applied to mineral bodies, it is capable of producing not only the effect of *composition*, as well as that of *decomposition*, but, in many instances, that of *recomposition*: *i. e.* by putting together bodies, such as they are in their *natural* state, it produces *new* ones;—bodies possessed of properties never before made manifest. By *decomposing*, *i. e.* resolving into their respective constituent elements, bodies such as they are in their natural state, it *thus* also produces *new* ones: and moreover, after thus resolving a body into its constituent elements, it, in many instances, is able to put them together again, in such a manner as to reproduce the very body so decomposed:—a body composed of the same elements, and not, in respect of any of its properties, distinguishable from it. Applied to *vegetable* or *animal* bodies, its powers are confined to *decomposition*: neither to *composition* or *recomposition* do they extend. Of these *organized* bodies, the formation is a process by much too secret and refined, to be copied by human art.

In the course of the instruction given in *Chemistry*, as it comes to be applied respectively to the subjects of the *mineral*, *vegetable*, and *animal* kingdoms, occasion will occur for recalling, enlivening, extending, and fixing in the memory,

the information received in relation to them, in Stage I.

(31.) [*Meteorology.*] From two Greek words, the first of which signifies *aloft* or *elevated.* No sooner does a substance break free from any of those bonds, by which, while remaining in a state of *solidity* or *liquidity*, it has been confined to a determinate part of the earth's surface, than it enters into the province of *Meteorology*, and there continues, until, by any of those revolutions of which the *atmosphere** is the constant theatre, it is again brought into immediate contact with, and made to form a portion of, some one or more of those solid or liquid masses. Thus, after having been raised, by *solution* in the incumbent air, and then again *precipitated*, water, on its descent towards the dense part of the earth's surface, becomes, according to circumstances, *mist*, *rain*, *hail*, or *snow*;—remaining all the while, and until it has reached that dense part, amongst the subjects of meteorology. So likewise the *electric fluid*, when, by the magnitude of its quantity, it gives birth to those appearances, which, under the denominations of *thunder* and *lightning*, are sometimes so fatal, and, to many a timorous mind, at all times so tremendous.

(32.) [*Magnetism.*] From a Greek word, which

* The *atmosphere*, i.e. the miscellaneous mass of matter in a gasseous state, with which those parts of the earth's surface, which are in a *solid* or *liquid* state, are constantly encompassed.

signifies *a loadstone*: this naturally compounded species of mineral, having *iron* for its principal element, being the only body, in which the peculiar relation, in the way of attraction and repulsion, to other bodies of the same sort, or to *iron*, was for a long time observed:—though latterly, by human art, means have been found, for establishing the same sort of relation between one piece of iron, prepared in a particular manner, and another; and still more recently, between *magnets* or magnetized iron, on the one part, and, on the other, a newly discovered species of metal, called *nickel*, the like relation has been observed.

A piece of iron, when brought to a proper form, and, after having, for the purpose, been *magnetized*, as above, left free to turn itself upon a centre, points towards a star which serves for giving name to the *north*, and thence to the other divisions of the universe, and to the corresponding points of the *mariner's compass*: by which means, without view of sun, moon, or star, the situation of the spot, at which the observation is made, with relation to every part of the universe, is at all times ascertainable. And thus it is, that, for shewing to him the *direction* in which he is moving, the magnetic needle is become an instrument, as necessary as it is simple, in the hands of the navigator.

(33.) [*Electricity.*] From a Greek word, which signifies *amber*. By mere rubbing, certain kinds

of bodies had, at different times, been found capable of being rendered productive of extraordinary appearances, and extraordinary changes, in other bodies: *attracting* them, *repelling* them, producing *light*, producing *heat*, and so forth. Of the sorts of bodies, by means of which these appearances are producible, *amber* having been the first, in which the power of producing them was observed, hence the whole system of those effects came to be designated by the name of *electricity*; as if one should say, *amber-work*.

By degrees, it having been observed that the property of producing those effects, is a property, which, under certain circumstances, is manifested by *all* matter, it was at length discovered, (viz. by *Benjamin Franklin*), that, among them are those, to which, when manifested upon the largest scale, the names *thunder* and *lightning* are applied.

Accordingly, to this head belong, at present, the means employed for securing person and property, from the destruction, of which those changes in the atmosphere are liable to become the source.

In some diseases, *electricity* has been applied, not altogether without success, in the character of a remedy.

(34.) [*Galvanism.*] From *Galvani*, an Italian, by whom, not long before the close of the last century, effects, in many respects coinciding with,

though in some respects different from, those produced by *electricity*, were found producible, without the help of friction or intercourse with the clouds, by a mere arrangement, made to take place between certain bodies in a solid, and certain others in a fluid state.

Magnetism, *Electricity*, *Galvanism*—in the hands of the chemist, the powers designated by those several names, more particularly *Electricity* and *Galvanism*, have become so many very efficient and active instruments: by *Electricity*, but still more particularly by *Galvanism*, bodies, which till then had been regarded as simple, having, principally under the management of *Sir Humphrey Davy*, been decomposed, and new ones, possessed of very extraordinary properties, brought, as it were, into existence.

By Magnetism, by Electricity, and in some degree by Galvanism, effects have thus been produced on other bodies, without any remarkable *change* in the *constitution* of the bodies employed as instruments in the production of those effects: and in this way it is, that these districts of the field of science appertain, in some respects, to the province of *Mechanics*. But, by the use and application made of them, particularly of *Electricity*, and most particularly of *Galvanism*, not only new properties have been observed, but prodigious *changes* have been made, in the *constitution* of most sorts of bodies: and in this way it is

that they appertain to the province of *Chemistry*.

(35.) [*Balistics.*] From a Greek word, which signifies to *cast:* called also the theory of *projectiles*, from a Latin word of the same signification. The mass projected is either in a *solid* or in a liquid state: in so far as it is in a *solid* state, the art of *Gunnery* is included in it: an art, which, in so far as concerns the *motion* produced, belongs, since the invention of gunpowder, to *Chemistry;* and in so far as concerns the giving *direction* to that motion, to *Mechanics*. In so far as the mass projected is in a liquid state, the art is that of making *Jets d'eau*, i. e. *playing fountains:* a branch which, by its perfect innocence and comparative insignificance, forms a striking contrast with the other.

In detail, neither can *Gunnery*, any more than *Fortification*, or *Navigation*, present any sufficient title to admittance into the *Chrestomathic* school: but, in so far as they are, all of them, comprehended in *Natural Philosophy*, it would be leaving an incongruous gap, not to give some general intimation of the general principles on which they respectively depend.

(36.) [*Geography continued.*] In the first Stage, the instruction relating to Geography will have been confined to mere *Topography:*—the knowledge of the divisions and remarkable spots, partly natural, partly factitious, observable on the earth's surface: beginning, of course, with the country,

in which the instruction is administered. At this next, and other succeeding stages, the same ground will be retrodden: and in it, as relative capacity advances, information will be afforded, of that sort, which, in books of *Geography*, used to be comprehended under that name, but of late years has been referred to a separate name, viz. *Statistics:* such as that which concerns *population*, the manner and proportions, in which the matter of *wealth*, the matter of *power*, and the matter of *dignity*, are distributed,—quantity and quality of *military force*, &c. &c.

(37.) [*Geometry continued.*] See *Stage I.*

(38.) [*Historical Chronology continued.*] In the same manner as *Geography*, presented at first in the state of a *naked* field, receives by degrees its proper *clothing*, so will *Historical Chronology*. In the one case, as in the other, the signs will come to be repeated: and, at each repetition, an additional quantity of information will be superadded.

To the account of the great military war and other political events, composed of battles, sieges, unions and dismemberments, acquisitions and losses of territory, changes in dynasties, and in so far as in the *Stage* and at the *age* in question, they can be made intelligible, in *forms* of *government*—to this will by degrees be added, the sort of information, designated by the term *Archæology*, i. e. *account of antiquities:* an account of the

state of *persons* and *things*, in *anterior*, i. e. *former* and *earlier*, so preposterously termed *antient*, times; including information respecting lodging, diet, clothing, military equipment, pastimes,—powers and functions—belonging to *offices*, civil, political, and religious, &c.

(39.) [*Appropriate Drawing.*] In the Chrestomathic school, the great use of *drawing* is, the giving *assistance* to, and serving as a *test*, and thence as a *cause*, of *proficiency* in the branches of *art* and *science* to which it is applicable. On this score, in so far as it is *appropriate*, it will adapt itself to those several subjects, in proportion as they are presented. But this direction receives a necessary modification, from the state of the *bodily organs* in question in respect of maturity.

(40.) [*Grammatical Exercises.*] See Table II. The objects aimed at in and by these exercises will be,—

1. To render the scholar acquainted with the *structure* of language in general, and that of his *own* language in particular: and, thereby, to qualify him for speaking and writing, on all subjects and occasions, with clearness, correctness, and due effect—in his own language.

2. By familiarizing, him with the greater part, in number and importance, of those terms belonging to *foreign* languages, from which those belonging to his *own* are derived—and in which the origin

of their import, and the *families* of words with which they are connected, are to be found,—to divest them of that repulsive and disheartening quality, of which so impressive an idea is conveyed, by the appellation of *hard words.*

3. To render the approach, to the several branches of art and science, as *smooth* and *easy* as possible, by rendering that part of the language which is peculiar to them, and which is mostly derived from *foreign*, and in particular from the *dead* languages, as *familiar* as any other part.

4. To lay a substantial and extensive foundation, for a more particular acquaintance, to the purpose of *reading*, with or without that of *conversation*, with the several foreign languages, *dead* and *living*, comprehended in the scheme, or such of them as, at a maturer age, shall be regarded as promising to be conducive to the scholar's *advancement* in life, or agreeable to his *taste.*

As to the *subjects* of these exercises,—in addition to the *rules of Grammar*, they may consist of select portions of *History* and *Biography*, taken from the most approved works composed in the several languages.

In any language other than his own, *composition*,—except in so far as *Translation* (see Tab. II. *Exercises)* or *Note taking* (see Stage V.) may be considered as coming under this head,—is pro-

posed not to be comprehended in this course, but to be reserved to some other *seat* of instruction, or for *self-instruction* at a maturer *age*.

(43.) [Stage III.] At this Stage, the general information, obtained in the two preceding stages, is still repeated—and the application made of it to the exigencies and gratifications of common life, rendered more and more particular and determinate, and brought still nearer to actual and common use.

(44.) [*Mining*.] Under *Mineral Chemistry*, have been brought to view—the different sorts of *simple* substances obtained by means of this *art*, together with the *new* substances, obtained by putting them together, and *combining* them, in groups and proportions, different from those in which they are found combined by the hands of *Nature*. Under the present head, a general view (and a very general one will suffice) will be to be given, of the manner in which this art is practised. In its quality of an *art*, operating upon *materials*, rendered more or less known by precedent *science*, it matches in some sort with *Architecture* and *Husbandry*, to which it supplies a considerable part of the *materials*, which they respectively employ.

(45.) [*Geognosy*.] From two Greek words: one of which signifies the *earth*; the other, *knowledge* or *understanding*. By this name, is designated what we have as yet been able to learn, concern-

ing the manner in which the matters, composing the substance of the earth, including so much of what is underneath the surface as hath been rendered accessible to us, are distributed. By *Geography*, the earth is viewed in one *direction:* by *Geognosy*, in *another* direction: by *Geography*, it is considered with a view to one *set of purposes*: by *Geognosy*, with a view to *another* set of purposes. *Geognosy* is among the new fruits of *Chemistry*. To the general gratification afforded to *speculative* curiosity, *Geognosy* adds the *practical* advantage, of affording indications—presumptive and experiment-saving indications—of the presence or absence of the valuable substances, for the extraction of which the *art of mining* is employed.

By the *remains* which it brings to light of the *dead* subjects, of the *vegetable* and *animal* kingdoms—some of them known, others not known, at present in a living state,—*Geognosy* includes *Archæology*, as applied to the *structure* of this our Globe.—(See Stage II. 38.)

(46.) [*Land Surveying.*] In an application, made of it at Stage II. to *Mechanics*, *Geometry* found *one* of its practical uses: in its application to *Land-surveying*, it will find another. In addition to the more elementary part, *Trigonometry* (from two Greek words, one of which signifies *a three cornered figure*, the other *measuring*) is a branch of the speculative science called *Geometry*,

which on this occasion will be brought into *practical* use. But in *this* instance too, as well as in that of *Mechanics*, the *simply enuntiative* parts of the *propositions* will serve by themselves; still leaving to a more advanced stage, such instruction, and such *exercises*, as take for their subject the *demonstrative* parts.

(47.) [*Architecture.*] From two Greek words: one of which signifies *chief* or *principal*; the other, *Handicraft work*.

For its *products*, and in that view its *subjects*, *Architecture* in general has *constructions* in general. *Constructions* may be distinguished, into *principal* constructions, i. e. constructions of independent use,—and constructions for the purpose of *communication*. Principal constructions are mostly *receptacles*. According to the nature of the *bases* on which the receptacles *rest* or *move*, they are distinguished into *terrestrial*, *aquatic*, and *aërial*:—fixt buildings, navigable vessels, and air-balloons.

Of *communication*, the principal instruments are, 1. Roads. 2. Canals, including *tunnels* and *drains*. 3. Quays, including *Wharfs* and *Jetties*. 4. Bridges.

Substituted to the present costly and comparatively useless stock of a *toy-shop*, *architectural* models of buildings and furniture, might, if made to take to pieces and put together again, be to this purpose productive of real and lasting use.

(48.) [*Husbandry*, including *Theory of Vegetation* and *Gardening*.] On this occasion, application will come to be made, of the instruction obtained in relation to the *mineral* as well as the *vegetable* system, in Stage I.—and in relation to *Vegetable Chemistry*, in Stage II. So, of the instruction obtained in relation to *Architecture*, in so far as concerns Barns, Drains, and other *constructions;* and in relation to *Husbandry* itself, in so far as concerns *implements*—employed, or with advantage employable, in Husbandry. How to convey and committ to the *earth* to the best advantage, the *seeds* and *other germs* of its *products*,—as well as how to collect and convey to the *store* or the *market* the products themselves when ripe, or otherwise ready for use;—so likewise how to collect, convey, and committ to the earth the *manure* employed in their production—will be learnt principally from *Mechanics:* how to preserve them against corruption and combustion,—as well as how to choose, prepare, and keep the manure—from *Chemistry*. So in *Gardening*, how to employ artificial heat and shelter in the improvement or preservation of those choicer vegetables which are the subject of that art. *Cattle*, not to speak of *Bees*, are all of them among the *fruits*, some of them among the *instruments*, of Husbandry. For what concerns the care of their *health*, reference will be to be made to Stage IV. Among the inferior animals, *Husbandry* has a

multitude of *enemies*. For the most effectual modes of destroying them, reference will be to be made to Stage IV. But, to this purpose it may be necessary to obtain more or less knowledge in relation to them: and, for this knowledge, the *foundation* will at least have been laid in Stage I.

(49.) [*Physical Economics*.] *Physical*, from a Greek word, which signifies *Nature*, in contradistinction to *moral*:—*Economics*, from two Greek words: one of which signifies *a house*; the other, *management*. Of *Mechanics* and *Chemistry*,—partly in an immediate way, partly through the medium of *Architecture* and *Husbandry*,—of Mechanics as well as Chemistry, but principally of Chemistry,—application will here be made to all the various *physical* concerns of a *family*: *care* of *health* excepted, for which see Stage IV.

From Chemistry more particularly, will be deduced and administered, an all-comprehensive stock of practically useful information. *Maximization* of bodily *comfort* in all its shapes—*minimization* of bodily *discomfort* in all its shapes—*minimization* of the *labour* and *expense* applied to both these intimately connected purposes—these will the art in question have for its *ends* in view. [For *maximization* and *minimization* see Table II. *Principles*.] Articles of household *furniture*, *apparel*, *food*, *drink*, and *fuel*, these it will have among its principal *subject matters*: *warming*, *cooling*, *moistening*, *washing*, *drying*, *ventilating*,

lighting, *clothing*, *cooking*, *preserving*,—*repairing*—*restoring*—these it will have among its principal *operations*: *air*, *heat*, *cold*, *light*—substances, some in a *solid*, some in a *liquid*, some even in a *gasseous* form,—substances, indefinitely diversified in *form* and *texture*,—substances, from all three *kingdoms*, mineral, animal, and vegetable,—some natural, some factitious—some simple, some compounded,—these it will have for its *materials* and *instruments*.

(50.) [*Hygiastics* or *Hygiantics*.] From a Greek word, which signifies appertaining to *health*:—the branches of art and science, which appertain to health; i. e. to the *preservation* as well as *restoration* of it.—*Medicine*—*Physic*—the words most commonly employed on this occasion—are inadequate and delusive. Under the name of *Medicines* or *Physic*, drugs are conceived as being to be conveyed into the stomach; and, to the choosing and preparing of these *drugs*, the idea of this most extensive and diversified cluster of arts and sciences is thus confined.

Of all the *bodies*, which it can be the object of this or any other course of instruction, to render the scholar more or less acquainted with,—there is not one, the state and condition of which can be of near so much importance to him as that of his *own*. At this time of life, few, it is true, in comparison, are the instances, in which the body is in any way constantly out of order: not a few, in

which it scarce ever is. Partly to this cause it seems to be owing, that, in the education of youth, so important a branch of instruction has experienced so general a neglect. Several others however have likewise been contributing their share towards the production of this effect. At the time or times, in which the plan of *School* education (not to speak of *University* education) received its form, *Chemistry*—one of the necessary bases of *Hygiantics*—had no existence: and, of the nine other arts and sciences, which, as below, may be stated as being subservient to it, several were nearly in the same case. In those days, the art not having any clear foundations, there was scarcely any thing which—especially to a mind of the age of a school-boy's—was capable of being taught.

Very different is the case at present. When, by instruction in the several branches herein enumerated, a clear *foundation* has been laid—as in a moderate space of time it may now be laid—a few *rules* may, at a still more moderate expense of time and words, be taught and learnt to great advantage. How to guard against *disease* and *death;* considered as liable to be produced, by suddenness or excess of *heat, cold,* or *moisture,*—by *want* of respirable *air*—by excess in *diet* or bodily *labour:*—how to apply to one's self, or to obtain from friendly ignorance, the speediest as well as most effectual relief,—in the case of those

accidents, in which the most common disorders take their rise:—a *burn*, a *scald*, a *flesh wound*;—*lameness* produced by *corns*; *indigestion* in its various symptoms;—pains of the *rheumatic* kind, in the head, tooth, or ear;—what is called a *cold*, in the several shapes in which that malady is most apt to make its appearance:—how to operate towards the recovery of persons apparently *drowned*:—in *serious* cases in general, what to do in the mean time, until *professional* assistance can be obtained; and when obtained, how to form some judgment as to its competency. To *females*,—partly on account of the infirmities peculiar to that sex, partly on account of the almost exclusive share which they possess in the management of children of both sexes for several years after birth,—this branch of knowledge is, in a more peculiar degree, important. In point of fact, all *Mothers*, —all *Nurses*,—are *Physicians*. Partly by remedies altogether unapt, partly by ill applied ones, partly by ill grounded and false theories,—in uninstructed families, especially in those in which the expense of professional advice is an object of alarm, it may almost be a question—whether more mischief is not done by medicine, than sustained for want of it. Children, in particular, are not unfrequently enslaved and tormented by unnecessary precautions and groundless fears. Great would be the value of sound *hygiantic* instruction, were it only in the character of a pre-

servative against the certain mischief to the purse, and not improbable mischief to the constitution, by *quack-medicines*;—medicines of unknown composition, presented by those to whom the patient, and with him the particular nature of his case, is unknown. Various are the impositions of which the human body is liable to be made the subject: by a moderate quantity of *hygiantic* instruction, such as the course in question could not fail to afford, the mind is rendered proof against them all. It would have its use, were it only to enable a patient to make, to his professional adviser, a correct, complete, and conclusive report of his own case.

(51.) [*Physiology.*] From two Greek words: one of which signifies *nature* or natural state; the other, *an account*:—an account of the several component parts of the body, as well those which are naturally in a liquid, as those which are in a solid state.

(52.) [*Anatomy.*] From a Greek word, which signifies *dissection*, *cutting up*. The parts of the body, to which it can apply, are of course no other than those which it finds in a *solid* state.

(53.) [*Pathology.*] From two Greek words, the first of which signifies *sensation*:—an account of the *sensations*, which the human frame is liable to experience; more particularly the *painful* or uneasy ones.

(54.) [*Nosology.*] From two Greek words; the first of which signifies a *malady*, *disease*, or *disorder:*—an account of the several maladies, diseases, or disorders, which the human frame is liable to experience.

(55.) [*Diætetics.*] From a Greek word, which signifies *habitual mode of life*, more particularly in respect of *food* and *drink;* whence the English word *diet:*—the knowledge of what appertains to *diet;*—of the influence, which, as well in other respects as in respect of *nourishment*, substances, commonly taken into the stomach, have, on the state of the animal frame.

(56.) [*Materia Medica.*] Two Latin words, which signify the *matter*, of which *medicines*—(substances applied to the stomach or other parts of the body, for the cure or prevention of disorders) are composed.

(57.) [*Prophylactics.*] From a Greek word, which signifies *measures of precaution.*

(58.) [*Therapeutics.*] From a Greek word, which signifies to *cure* or *endeavour to cure*, a disorder.

(59.) [*Surgery, or Mechanical Therapeutics.*] *Surgery*, from two Greek words: one of which signifies a *hand*, the other *operation*. *Mechanical* Therapeutics it may be called, because, in so far as, in the endeavour to cure or relieve a disorder, the hand of an operator is considered as being

employed,—the *means* employed belong to the *mechanical*, in contra-distinction to the *chemical*, walk in the field of art and science.

(60.) [*Zoohygiantics* or *Zohygiantics*.] From two Greek words: one of which, as above, signifies an *animal*; the other, as above, *pertaining* to the care of *health*:—the arts of preserving and restoring health, considered as applied to the *inferior* animals; viz. to such of them, in the health of which, man is, on any account, wont to take an interest. Branches of art and science—viz. branches *condividents* or *subservients*—*hygiantics* thus applied, has, of course, the same,—in quality and number,—as when applied to the human species, as above.

Applied to the inferior animals, *Anatomy* is in use to be styled *Comparative Anatomy*. With equal propriety the term *comparative* might, it is evident, be applied to the eight other branches above enumerated.

For answering (which it does, however, but in part) the purpose of the above word *Zohygiastics*, the only word as yet in use is—the *Veterinary Art*: from whence the *Veterinary Surgeon* takes his name. *Veterinary* is from a Latin word, which signifies *to carry*. Of all the inferior animals, in the health of which it may happen to man to take an interest,—the only ones to which this appellative applies, are therefore the very few, which come under the denomination of *beasts of*

burthen. By its literal analogy to the word *veteran*, derived from the Latin word which signifies *old*, it has moreover the inconvenience, of presenting some such idea as that of the *Old Man's* or *Old Woman's art*, more readily than the branch of art which it is employed to designate.

(61.) [*Phthisozoics.*] From two Greek words: one of which signifies to *destroy;* the other, *an animal*, as above:—the art of destroying such of the inferior animals, as, in the character of natural *enemies*, threaten destruction, or damage,—to himself, or to such animals, from which, in the character of natural *servants* or *allies*, it is in man's power to extract useful service,—is an art, not much less necessary, than that of preserving, and restoring to health, those his natural *friends*.

Animals which, either immediately or mediately, as above, are regarded as noxious to man, are commonly included under the general appellation of *vermin*. *The Compleat Vermin-Killer* is the title of an old established book.

(61.) [*Mathematics.*] From a Greek word, which signifies *learning in general:* so inapposite and uncharacteristic, is the only word, as yet employed for giving expression to this branch of art and science.

(62.) [*Geometry.*] (63.) [*Arithmetic.*] See Stage I.

(64.) [*Algebra.*] From an *Arabic* word, the signification of which seems not to be exactly known.

By *Geometry*, *quantity* is considered with relation to *form*, *shape*,—or, as on this occasion it is more common to say, *to figure*;—by *Arithmetic* and *Algebra*, *without* relation *to figure*. In so far as *figure* is out of the question, *number* is the only form, in which *quantity* is susceptible of diversification. In so far as the number in question is represented by the appropriate characters, called *cyphers*, but more commonly *figures*,* the amount of it is thus, in a *direct* way, made known; and *Arithmetic* is the name employed in speaking of it: in so far as it is no otherwise expressed, than by means of some *relation*, more or less complicated and disguised, which it bears to some known number or numbers, *Algebra* is the name employed in speaking of it. For giving expression to such numbers as are as yet *unknown*—(all numbers in so far as they are respectively expressed by one simple line of the appropriate characters being *known*)—instead of *figures*, other signs (such as certain *letters* belonging to the Alphabet, and commonly taken from the *close* of it) are employed. This is for *shortness:* thus, instead of saying (i. e. writing) *first unknown number*, the Algebraist says, x; instead of *second* unknown number, y: and so, for a *third*, z. And, from time to time, for further abbreviation, other

* The use thus made of the word *figure*, in two senses thus different, and yet not so different as not to be liable to be confounded, is an unfortunate circumstance: but such is the state of the language.

letters again, taken from the *commencement*, or some other *anterior* portion of the Alphabet, are commonly employed. For *addition*, *subtraction*, *multiplication*, *division*, *equality*, and certain other terms of arithmetic, the shorter signs (+ − × ÷ =, &c.) being also employed, *Algebra* is thus, in respect of the *signs* employed in it, a species of *short-hand*:—of *short-hand*, applied to the particular subject of *quantity*, considered without reference to *quality*.

Can it be then (it will naturally be asked)—such wonders as have been performed by Algebra—can it be, that it is by mere *abbreviation*—by nothing but a particular species of *short-hand*—that they have been performed? by the mere use of a set of *signs* or *characters*,—by which the ideas in question are expressed in a less quantity of *space* and *time*, than would have been necessary, to the giving expression to them by the *signs* or *characters*, of which *ordinary written* language is composed, and by which those sounds are designated, of which the ordinary *spoken* language is composed?—Newton, Leibnitz, Euler, La Place, La Grange, &c. &c.—on this magnificent portion of the field of science, have they been nothing more than so many expert *short-hand writers?*

Answer.—Assuredly, the system of *abbreviated forms of expression* is one thing,—the *purpose* to which these modes of expression are employed is another and perfectly distinguishable thing. The

purpose, to which, in the instance in question, this species of *short-hand* is applied, comes, in every instance, within the description given above, viz. *by means of their relation to certain quantities that are known, the making known a certain quantity or certain quantities, which, in all other respects, are as yet unknown.*

But, for making out this relation, some contrivance in every instance,—and, in some instances, abundance of very subtle contrivance,—over and above the use of *short-hand*,—is, or at any rate originally was, necessary: and from the *short-hand* itself, the system, composed of these *contrivances*, is in itself no less distinct, than any one of the species of discourse (a *speech*, for instance, or the *evidence* of a *witness*), which *short-hand*, commonly so called, is employed in giving expression to, is distinct from the *short-hand*—the *mode of writing*—itself.

In that No. of the Appendix, in which an exposition is given, of some ulterior *principles of instruction*, by means of which the characteristic principles of the new system may (it is supposed) be applied to *Mathematics*,—and *that* with as much facility and advantage, as any, with which they are or can be applied to *Reading*, *Arithmetic*, or *Grammar*,—this subject will be resumed. In the mean time two observations may have their use.

1. The first is—that, though the *Algebraic* contrivances—the contrivances by which the alge-

braic *short-hand* is to the purpose in question made use of, are perfectly distinct from the *short-hand* itself—yet,—so prodigious is the facility, which, when the *short-hand* has once been learnt, is afforded by it,—that what seems probable is—that, had it not been for the *short-hand*, a very small part of those algebraic *contrivances*, which at present are in use, would at this time, if ever, have been discovered.—Compared with the words, by which the same ideas are expressed in ordinary language, the *Roman numerals* are a species of short-hand: compared with these *Roman* numerals, the *Arabian* numerals, now mostly substituted to them, are a highly-improved species of short-hand: a species by which alone, independently of the *Algebraic* short-hand, much greater progress would probably have been made in Mathematics, than, in the same quantity of time, would have been made with no other instrument of abbreviation than that which is composed of the Roman numerals.

2. The other observation is—that,—whether, without the *short-hand*, the *contrivances* would or would not have as yet been hit upon,—yet, now that they have been hit upon, being, as above, in the nature of the case, so perfectly distinct from the *short-hand*, there is nothing to prevent their being expressed without it: expressed by the words of which ordinary language is composed: —no more than there is, to prevent from being

written down in words at length, and so printed, a mass of *evidence*, which at a trial has been taken down in *short-hand*,—and which, but for the *short-hand*, could not have been taken down, unless a greater length of time had been allowed for the delivering of the evidence.

Hence comes the practical conclusion, viz. that, for the convenience of learners, it would probably be of no small use, if, in ordinary language—language clear from those *characters* and *formularies*, so appalling to every as yet uninitiated, and more particularly to the uninitiated juvenile eye—explanations were given of the several *contrivances* in question: or, if, in this way, the explanation of the whole system,—pursued to the length, to which it has already been carried,—would occupy too much space,—at any rate, of such points, as, by the joint considerations of *facility* and *utility*—*facility* in *acquisition*, and *utility* in *application*,—should be found recommended for preference.

(65.) [*Uranological Geography.*] *Uranological* from *Uranology*, which is from two Greek words: one of which signifies the *heavens*; the other, as above, *an account*:—an account of the heavenly bodies:—more commonly termed *astronomy*:—*Astronomy*, from two Greek words: one of which signifies a *star* or *planet*; the other, *arrangement*, or to *arrange*. But, in this field, the *space*, in which the bodies are considered as being in a state of *motion*, or in a state of *rest*, requires to be con-

sidered,—as well as the *bodies*, which are considered as *moving* or *resting* in that *space*: and, as for *the bodies*,—it is not by him who is called an *astronomer*, that the *arrangement* made of them has been made. (See Stage I. and see the next article.)

(66.) [*Uranological Chronology*.] See Stage I. When that *fixation of quantities*, which is not performable but by mathematical investigation, is discarded or postponed,—a very small quantity of time will suffice, for conveying a *general*, yet sufficiently instructive intimation, of what is ascertainable, in relation to such parts of the contents of the universe, as are in any way open to our observation. But, if this quantity, small as it is, be grudged, it is only in virtue of its application to *Geography* and *Chronology*, that *Uranology* can present any very decided claim to admission into the *Chrestomathic* course. In Stage I. *Geography* and *Chronology* were considered in the most simple and obvious point of view: and, accordingly, without reference to those relations between the *Earth* and the other celestial bodies, (principally our *Sun* and *Moon*), on which the facts belonging to these branches of science are so essentially dependent. In regard to *Uranological Geography* and *Uranological Chronology*,—the practical uses, to which these two branches of *Uranology* are applied, being different,—distinct names are accordingly required, for giving *expression* to them:

but, considered as *subjects of instruction*, the consideration of them is inseparable. To *Uranological Geography* more particularly, belongs the division made of *space*, on the Earth's *surface*; viz. the division into *climates*, and degrees of *latitude* and *longitude*: and the influence exercised by the *Moon* on the *tides*; i. e. on the motions of such parts of the earth's surface as are in a *liquid* state; perhaps also in the *winds*, i. e. on the motions of such parts as are in a *gasseous* state. To *Uranological Chronology* more particularly, belong the divisions made of *time*: viz. the natural divisions into *periods*, *cycles*, *solar years*, *months*, *lunar years*, and *days*; together with the ulterior factitious and arbitrary, but not the less necessary, divisions into *hours*, *minutes*, and *seconds*.

Place and *time* being considered together, and with reference to each other,—the heavenly bodies, employed as they are in the measurement of both these quantities, serve for the indication and guidance of the course of a ship at sea: and thus they are, as it were, taken up, and, in conjunction with the *magnetic needle*, employed as *instruments*, in the hands of the *Navigator*. On this occasion, by means of our organs of sight, *light* becomes a sort of instrument of *communication*, and thence of *measurement*, between this our planet and other component parts of the material universe: and, not only between those comparatively near orbs, on which the motions of our own have a percep-

tible dependance, and correspondent reciprocal influence,—but between our own and others, such as the *Moons* (called *Satellites of Jupiter*), the star called *the Polar Star*, and the other stars, which, for the purpose of distinguishing them from *Planets*, are called *Fixed Stars*,—the *motions* of which have for their place, a field, separated from that of our own planet, by distances, more and more extensive, till at last they stretch to such a pitch, as to bid defiance to all calculation:—the *motions*;—for it appears not that even the Stars called *fixt*, are exempt from that law of universal gravitation, of which perpetual as well as universal *motion* is the necessary consequence.

The short time necessary to a general acquaintance with *Uranology*, would not be altogether uselessly employed—would not be *unchrestomathically* employed,—had it no other use than that of preserving the mind against the alarming and predatory delusions, set to work by the species of impostor, called an *Astrologer*.*

(66.) [*Technology*.] From two Greek words: the first of which signifies an *art*. In the list of separately administered branches of instruction, this

* Under the title of Sibley's Astrology, a work has been seen, containing no fewer than four thick 4to. volumes, of very recent date. A work of such expense could never have been published, but under the assurance of a considerable number of purchasers, all of whom must necessarily have been found in the most opulent and extensively educated classes.

article may serve to close the last Stage. On this occasion, as far as time will admitt, a *connected* view is proposed to be given, of the *operations* by which *arts* and *manufactures* are carried on. The more *general* information, obtained, in Stages II. and III. in relation to *Mechanics*, and *Chemistry*, and some of their dependencies, will thus be extended farther on in the region of *particulars*. On this occasion will be to be shewn and exemplified, the advantages, of which, in respect of *dispatch* and *perfection*, the principle *of the division of labour* is productive.

Here will be shewn, how, by the help of this most efficient principle, as *art* and *science* are continually making advances at the expense of *ordinary practice* and *ordinary knowledge*, so *manufacture* (if by this term may be distinctively designated *art*, carried on with the help of *the division of labour*, and thence *upon a large scale*) is continually extending its conquests, in the field of *simple handicraft art*—art carried on *without* the benefit of that newly found assistance.

To reduce the apparent infinitude of the subject within a comprehensible compass, it will be necessary, under the direction of the Logician, to apply the *Tactics* (the art of arrangement) of the *Naturalist* to the contents of the field of the *Technologist*:—to bring together, and class the several sorts of *tools* and other *implements*,—and *that*, in such a manner as to shew how they agree with,

and differ from, each other. In its character of a *school of Technology*,—the *Chrestomathic School*, though not a *place*, would thus be a *source*, of general communication: *a channel*, through which the several sorts of artists might receive, from one another, instruction in relation to points of practice, at present peculiar to each. The *Carpenter*, the *Joiner*, the *Cabinet Maker*, the *Turner in wood*, the *Ship-builder*, &c.;—The *White-smith*, the *Blacksmith*, the *Metal Founder*, the *Printer*, the *Engraver*, the *Mathematical Instrument Maker*, &c.;—The *Taylor*, the *Shoemaker*, the *Collar Maker*, the *Saddler*, &c.;—The *Distiller*, the *Brewer*, the *Sugar-Baker*, the *Bread-Baker*, &c.;—of all these several artists, the respective *tools* and other *implements*,—together with the *operations* performed by means of them,—will thus be to be confronted together: and a comparative and comprehensive view will thus be to be given of their points of resemblance and difference.

Not to speak of the mutual information, capable of being by this means derived from one another by the *artists* themselves,—to the *scholars*, the effect will be that enlivening consciousness of mental vigour, and independent power, which is the fruit of learning in general, reaped from the soil of a highly cultivated mind. As, in virtue of the *Grammatical Exercises*—in the *Language*, in which the instruction is delivered, there will be

no *hard names*,—so, in virtue of the *Exercises*, of which the field of *art-and-science* learning, including this appendage to it, is the subject,—in the whole field of useful instruction there will be no *dark spots*.

So far as concerns the middling classes,—the more extensive the view, thus obtained by the scholar, of the field of *Technology*, the more *usefully*, and to the bent, *natural* or *adventitious*, of his taste and inclination, the more *favourably*, (consideration had at the same time of his family circumstances and connexions) will he thus find the field of his *livelyhood* enlarged.

(67.) [*Book-Keeping at Large.*] The *commercial* process or operation, on the subject of which, under the name of *Book-Keeping*, works, in such multitude have been published, is but a branch—a particular application—of an art, of the most extensive range, and proportionable importance: viz. the art of *Book-Keeping at large*;—the art of *Registration*—of *Recordation*—the art of securing and perpetuating *Evidence*. See Table II. *Principles*, Class III.

Correct, *compleat*, *clear*, *concise*, *easy to consult*, —in case of *error*, so framed as not to *cover* it, but to *afford indication* of it,—*appropriate*, i. e. adapted to the particular practical purpose it has in view,—the purpose, for the sake of which the labour thus bestowed is expended,—in these epithets may be seen the *qualities* desirable in a sys-

tent of this kind. The new system of instruction —at any rate the original inventor's edition of it— presents to view a perfect specimen of the practice of this art, as applied to those inferior branches of instruction, which it has already taken in hand. In the Chrestomathic School, the principle thereby indicated will of course be pursued; but, proportioned to the superior extent of the *field* assumed by it, will necessarily be the extent and variety of the *application* made of it. In the practice of this most universally useful art, all those Scholars, who, from the lowest up to the highest Stages, in the character of *Teachers*, *Private Tutors*, or *Monitors*, bear any part in the management of the School, will gradually be initiated, and insensibly perfected: and, in proportion as any *Scholar* appears qualified to take any such part in it, it will be the duty and care of the *Master*, to put the means of so doing into his hands.

As, by the undermentioned *Abbé Gaultier*, the principles of the art of *Abridgment-making*, and thence of *Note-taking*, have been exhibited in a general point of view,—so, between this time and the time at which the Chrestomathic population has reached its last and highest *stage*, no doubt but that some apt person will be found to perform the correspondent good office, in favour of the art of *Registration*, or *Book-Keeping* at large.

(68.) [*Commercial-Book-Keeping*.] Commonly called, without addition, *Book-Keeping*. As well in the form of *money* as in that of *money's worth*, the Chrestomathic School will, at all times, have its *receipts*, its *expenditure*, and its *stock in hand*. In its system of *Book-Keeping at large*, it will therefore, in so far, comprize, and possess a system of *Commercial Book-Keeping*. But, to the Scholars, when they go abroad in the world, it will not suffice, that they are initiated in the particular system of *Book-Keeping*, in use in *that* establishment: to such of them, at least, as hereafter betake themselves to any *commercial* occupation, it will be matter of *advantage*—not to say of *necessity*,—to be no less perfectly acquainted with whatsoever system is in use in *other* establishments, and especially in those of which *commercial profit* is the object or end in view. The *Italian* method, or method of *Double Entry*, is the name given to that system of Book-Keeping, which is commonly employed in Establishments of superior importance. Unfortunately, old-established as it is, the *obscurity* of this method is still more conspicuous than its *utility;* and, in consequence, *generation*, instead of *correction* of Error, is but too frequent a result. This obscurity has for its sole *cause*, the *fictitiousness*,—and thence the *inexpressiveness*, or rather the *misexpressiveness*,—of the language. The *fiction* has place in two principal instances: 1. in the employing

the word designative of *debt*, in cases in which no such transaction really has had place: 2. in the ascribing to objects incapable of contracting this or any other obligation,—such as the several articles, of which the mass of commercial stock is composed,—the *capacity* and *act* of contracting that same *legal obligation.* 3. Moreover, in direct opposition to an incontestable *principle of evidence*,—the original *Record-book*—the basis of all the other books—is branded with a note of worthlessness, under the name of the *Waste-Book.* Meantime, for the several events and states of things, to which these fictitious denominations are allotted,—it cannot be, but that other denominations,—clear of Fiction, and, in a direct way, and to the apprehension of mankind in general, expressive of the objects requiring to be designated,—are to be found: and, by any such universally apt expressions, so many expositions and explanations will be given, of the correspondent fictitious and unapt ones. In this design, a little work on this universally useful branch of *Logic*, was long ago planned, and is at present in preparation.

(69.) [*Note-taking:*] i. e. taking *Notes* or *Memorandums* of the purport of any discourse, whether delivered *from book without book;* for example, as here, for the purpose of *instruction:* and in the case of *exhibitions*, with or without memorandums taken, of the appearances presented by the

objects *exhibited.* The *time*, during which these notes *are taking*, being no other than the time during which the discourse is delivering, and the object exhibiting,—including any such *pauses* as may happen to take place,—the consequence is—that, with relation to the *original* from whence they are taken, any such notes can scarcely have place in any other form than that of an *abridgment;*—and *that* an abridgment made *extempore*, upon the spur of the occasion, with very little time employable in the process of *consideration.* On this occasion, use will naturally be made of a masterly little work on this subject, published in English, by the *Abbé Gaultier.*

Note-taking being, in so far as the note falls short of being a compleat copy, a species of *composition*,—and, as such, in some sort, a product of *invention*,—and *that* product produced *extempore*, —and affording, at the same time, the most correct *test* of the correctness and compleatness, of the conception which, as appears by the note thus taken, has been formed of the original discourse,—this is the sort of *exercise*, to the performance of which the maturest state of the mind is requisite: and which, therefore, ought to be the *last* of all the exercises, performed in relation to the several subjects of instruction that have place in the whole of the aggregate course. When all the several particular courses have been gone through, *without* the benefit of this auxiliary task,—then

will be the time for determining, which of them stand most in need of it, and thereupon to which of them it shall be afforded.

(70.) [*School Room insufficient:*] viz. space in the school itself. In most instances,—*Dancing*, *Riding*, *Fencing*, for example,—the objection is obviously an insuperable one. In that of the *Military Exercise* so would it be, so far as concerns the particular portion of covered space in question: but, suppose a proper spot obtainable in the near neighbourhood, *this* objection at any rate vanishes.

(71.) [*Admission pregnant with exclusion:*] i. e. the branch of instruction in question such, that by admission given to it, exclusion would unavoidably be put upon others; viz. upon some one or more or all of them. Thus, if instruction in *Music* were admitted, the noise would be such, that while it was going on, the requisite degree of attention could not be paid to any other. So, if instruction in relation to controverted points of *Divinity* were admitted, whatsoever were the tenets taught, a parent to whose notions those tenets were to a certain degree repugnant, would not send his child to a school, which numbered among its objects and its promises, the impregnating with those tenets the minds of its scholars.

(72.) [*Time of life too early.*] Supposing that, in the instance of the branch of instruction in question, this objection could not, if considered

as applied to the time of admission, be other than a peremptory one,—it would not follow, but that, before the close of the aggregate course, it may have altogether ceased.

(73.) [*Utility not sufficiently general.*] In the character of a *ground of omission*, this objection can scarcely be admitted to hold good, except in so far as *admission* would have for its effect the putting an *exclusion*, either altogether or in part, upon some other branch, of which the utility is more extensive: for, at any rate, the *Advantages*, attached in common to all learning, (as per *Col. I.*) would be among the fruits of it.

(74.) [*Gymnastic Exercises.*] *Gymnastic*, from a Greek word, which signifies *naked*. In the warmer climates of Greece, exercises, requiring bodily exertion, used to be performed in a state more nearly approaching to *nakedness*, than that in which they are commonly performed, in times and places, in which, as with us, there is less heat and more delicacy.

(75.) [*Military Exercise.*] See (70.) *School Room insufficient*, and (76.) *Art of War.*

(76.) [*Art of War:*] including *Tactics*, *Military* and *Naval*. Of this art, the *Military Exercise* is itself one branch. So far as concerns this branch, neither can the *utility* of it (when the female sex is excepted) be said not to be sufficiently *general*, nor the *time of life* too *early*, so

far as concerns the last year or two of the proposed school time.

(77.) [*Private Ethics or Morals.*] Important as is this branch of art and science, admission cannot consistently be given to it, in the character of a *distinct* branch of art and science. *Controverted* points stand excluded,—partly by the connexion they are apt to have with controverted points in *Divinity*,—partly by the same considerations, by which controverted points in divinity are themselves excluded. *Uncontroverted* points will come in,—come in of course, and without any particular scheme of instruction,—on the occasion of such passages in *History* and *Biography*, as come to be taken for the subjects of *Grammatical* and other *Exercises*.

399. 401.
4. *Scholar*
ployment max
Scholar Order-p
ployment maxi
ciple. 11. 90. 21
5. *Master's ti*
ing, or *Nil per*
suos, principle.
6. *Regular V*
Constant Sup
providing, princi
213. 227. 323. 4
427. 431. 432.
breviating, P
110. See No
280. 281. 31
35. v. *Un*
or *pattern e*
sally and *sim*
rection emp
254. 270. 27
36. vi. N
commoration
252. 282. 28
37. vii. P
Metre - em
principle.
38. viii.
or *Task-alt*
252. 283. 28

CHRESTOMATHIC TABLES.

TABLE II.

CHRESTOMATHIC TABLES.

TABLE II.

I.—NOTES TO THE *EXERCISES*.

(a.) [*Chrestomathic.*] A word formed from two Greek words, signifying *conducive to useful learning*. After it was framed, it was found employed in a book of the 17th century, and probably would be to be found in other books.

(b.) [*Mathetic.*] From a Greek word, which signifies *conducive to learning*. Syn. (i. e. *Synonymous terms* or *phrases*)—*Imbibitive, Acquisitive* exercises: exercises, by the performance of which, *instruction* or *learning* is *imbibed, acquired, obtained;* by which *progress is made, proficiency obtained,* or a lesson *got: simply* mathetic, to distinguish them from those which may be termed *mathetico-docimastic,* as per No. (9), by which progress is *made,* and at the same time *exhibited.*

Correspondent, and, in its performance, *precedent,* as well as in some cases *subsequent,* to each species of exercise performed by the *learner,* is a *didactic* operation, *(didactic,* from a Greek word, signifying *conducive to teaching),* which must be performed by the *teacher.* From the general nature of the case, the nature of the didactic operation, correspondent to the mathetic exercise, will, without much difficulty, be conceived: but for greater clearness, and more particular designation, will in each instance be here given.

(c.) [*Probative.*] Syn. *Docimastic:* from a Greek word, which signifies the affording experimental proof, such as in chemistry is afforded by the case of a *test:* exercises, by the performance of which *proof* of progress or proficiency, and, if any, of the *degree* of it, is made: to this head belong the exercises, by the performance of which a lesson is *said.*

(1.) [*Orally or Scriptitiously.*] Orally, i. e. by word of mouth; scriptitiously, *i.* e. in writing, or in print: [*in terminis*] Syn. in the very *terms,* in the very words;—in *tenor.*—*Correspondent* DIDACTIC

OPERATION, *Delivery, oral* or *scriptitious*, of these same portions of discourse.

(2.) [*In purport.*] *Syn.* in words, which, however different, present the same *import, sense, meaning, signification*—the same *ideas*—are to the same *effect*.

On the difference between *tenor* and *purport* depends, (it will be seen), in several very material respects, the nature and effect of this, and the *recitative* and *responsive* exercises, Nos. 5, 6, 7, and 8: viz. according as it is in *tenor* only, or in *purport* only, or in either indifferently, that the *recital* or *responsion* is required to be performed. See *Principles*, No. 23.

(3.) [*Sensible Objects.*] Such objects, by which ideas are presented to us, through the medium of any of our five *senses*. These are—1. In so far as *natural history* is the subject, bodies and portions of matter, in the state, whether of *rest* or *motion*, in which they are found or observed, before they have been made to undergo any change by *human* art:—2. In so far as either *experimental philosophy*, or *technology*, (i. e. knowledge of what belongs to *already established arts*) is the subject, they will be found referable to one or other of four heads:—viz. *operations, subject matters, instruments and results:* 1. Operations, i. e. *motions*, produced with the view of producing the *results:* 2. Subject matters operated *upon;* 3. Instruments operated *with*, or *by means of*; and 4. Results, which are mostly *bodies*, brought into some new form; but, in some instances, *motions* produced for some special purpose. *Correspondent didactic operations*—Making *exhibition* of those same sensible objects.

(4.) [*Organic Exercises.*] Exercises, in the performance of which, *bodily organs* are employed: as—in the case of *pronunciation, spelling*, and *reading*, the organs of *speech;* in the case of *drawing* and *writing*, the *hands;* and not merely, as in the case of *recollection*, the powers of the *mind*.—*Correspondent* DIDACTIC OPERATIONS—*Prescription* and *direction*, of these same organic exercises: and, in case of *drawing* and *writing*, *inspection* of the several products.

(5.) [*Simply Recitative Exercises.*] *Recitative*, i. e. consisting in the *reciting* or *repeating*, of some portions of discourse, as delivered, by *word of mouth*, or in *print* or *writing:* for which purpose it must have been *gotten by heart*, as the phrase is; and, accordingly, if delivered in *print*, said *off book*, as the phrase is, or *out of book*, or *without book: simply*, viz. to distinguish this from the *responsive* exercises, No. (7.)

(7.) [*Responsive Exercises.*] *Correspondent* DIDACTIC OPERATION, *interrogative examination*, i. e. *prescription* and *direction* of this same exercise.

(9.) [*Test* of *Intellection.*] i. e. as a *proof* of his *understanding*, or a *trial* how far, if at all, he understands, what he has *heard* or *repeated*; for, a case, which otherwise is but too apt to happen, is that, after having *heard*, or after having *read*, and thereupon learnt to *repeat*, though it be ever so correctly and completely, the *words* of a discourse, which, for that purpose, have been *delivered* to him,—the pupil, instead of laying up in his mind the proper, i. e. the intended, *meaning*, No. (2.), the *meaning* which the words were intended to *convey*, and in the *conveyance* of which consists their sole *use*, contains in his mind—has in his *memory*—nothing but the bare *words*—i. e. the *sounds*, with or without the *forms* presented to the eye by the series of the *letters*: i. e. *no* meaning at all, or some meaning more or less *improper*: more or less *incorrect* or *incomplete*. For putting him to this trial, one mode or *test* is—the calling upon him, viz. by a *question*, expressed, whether in the same words, or in different words, to deliver the *same meaning*, but expressed in *other words*. Another expedient is confined to the case, where the object of the instruction is—to teach the practice of some branch of *art*, to the practice of which the exercise of some *bodily organ* is necessary,—or some branch of *science*, the *possession* of which is capable of being *proved* by the *practice* of some correspondent *art*: in this latter case, the *fact*—viz. of his *understanding* the *meaning* of the *words*, by which the instruction in question, relative to the *science*, was expressed, is capable of being *proved*, in some degree, by his performing some *organical operation*, by the performance of which the correspondent *art* is practised.

Thus, in so far as his *pronunciation* is correct, he affords a proof, that the instructions, which have been conveyed to him on the subject of the art of *speaking*, are, in so far, not only *remembered* by him, but *understood*: in so far as his *writing* is correct, that the corresponding instructions, on the subject of the art of *writing*, are, in so far, not only remembered, but understood: if, after the description given to him of the characteristic marks of this or that species of *plant*, or *animal*, or *tool*, or *utensil*, or *mathematical figure*, he is able to give expression, and has accordingly given expression, to these same marks, by *drawing*, here, likewise, in so far as the *figure* drawn by him is correct, he has afforded a proof, that that same description has not only been *remembered* by him, but *understood*. *Correspondent* DIDACTIC OPERATIONS, Prescription and direction of those same exercises, organic operations; and, in the case of *drawing* or *writing*, inspection of the result.

(10.) [*Note-taking.*] The principal and most immediate use of this exercise, is to serve as a *test* of *intellection*, as per No. (9): especially

in so far as the nature of the subject admits not the application of the sort of *organic* test, therein described.

But in it is included a certain species of *composition*, and thereby a certain degree of *invention*. It is therefore among the *highest* species of exercise: a task, for the due and effectual performance of which, the maturest state of the minds, for which the course of instruction here in question is designed, will probably be found requisite. *Correspondent* DIDACTIC OPERATIONS, *Prescription* and *direction* of this same exercise, and *inspection* of the *notes*, which are the result of it. To one or other of these exercises, *mathetic* and *probative*, or both in one, every possible mode of instruction, applicable to *intellectual* instruction in general, will, it is supposed, be found reducible: and if it be true, as supposed, that there is not one of them which is not,—and that with the full benefit of the Bell Instruction System,—applicable to all the several branches of that learning, enumerated in the course of this work, the applicability of that system, with a degree of advantage equal to what has been so universally experienced in the lower order of schools, to those several branches, when taught in the proposed Chrestomathic School, will, it is hoped, be found to be placed out of the reach of doubt.

(11.) [*Parsing.*] In the exercise called *parsing*, two distinguishable operations are supposed to be commonly included: viz. 1. Indication of the grammatical *relations*, which the component words, of each sentence, bear to another:—2. Indication of the grammatical *rules*, by which the custom of the language in those particulars is expressed, and conformity to that custom accordingly prescribed.

[*Canoniphantic.*] From a Greek word signifying a *rule*, and another signifying *indication*. *Correspondent didactic operation.* Prescription and direction of this same exercise, and if performed in writing, inspection of the result. This same description applies to the several didactic operations, corresponding to the several exercises hereinafter mentioned.

(12.) [*Single Translation.*] This exercise wears a different character, and is productive of different effects, according as the *vernacular* language is or is not one of the two languages: and if yes, according as the *foreign* language in question is translated *from*, or translated *into*.

(13.) [*Double* or *reciprocal Translation.*] This exercise wears a different character according to the diversifications mentioned in the case of single translation, and according as literal conformity on the one or the other side, or on both, is or is not exacted.

(14.) [*Clark's Exercise.*] Advantages attached to this exercise, in comparison of translation *into* or composition *in*, the foreign language,

with the help of a *dictionary*. 1. Saving of the *time*, *necessary* to the finding out of the word. 2. Saving of the *time*, *naturally* and frequently consumed, in *inaction* or *irrelevant reading*, in the course of the search. 3. Saving of the *perplexity*, attendant on the *choice* between the several words presented by the dictionary: a choice, to which for a long time the pupil continues irremediably incompetent.

(15.) [*Metre restoring.*] A verse being chosen by the Master, and the words thrown out of their order, in such sort that they no longer constitute a verse, this exercise consists in *restoring* them to their *order*: to which purpose some acquaintance with the nature of the *sort* of verse, and the rules of *Prosody*, *i. e. versification*, in general, is necessary. This exercise operates therefore as a *test*—not only of *remembrance*—but of intellection, with regard to those rules.

(16.) [*Prosodial non-significant.*] In schools this is called making *nonsense verses*. Accident will every now and then give to the nonsense the appearance of ludicrous sense. To this exercise, the *metre restoring* exercise may serve as an introduction. It affords a certainty of success: and saves the *time*, that would otherwise be to be employed in the search of words. By the shortness of the time requisite, it would be, in a particular degree, well adapted to the present system. See No. (31,) *Short-Lesson* principle. Whether it has any where been employed cannot here be stated. The idea of it was suggested by that of *Clark*'s Exercise.

(17.) [*Purely-metrical Translation.*] In this case the translation is *into* metre, and may be performed *from* other metre, or from prose: the exercise being purely metrical, the *language* is the same on both sides. One of the *Westminster School* exercises used to be—taking an epigram of Martial, or an ode of Horace, and translating it *into* some other of the species of verse to be found in the same books. Its objects are—1. familiarizing the learner with the *metre* into which he translates; 2. giving him a command of words in the *language*.

II. NOTES TO THE *PRINCIPLES.*

(d.) *(Principles of Management.)* Of the plan pursued in the giving of *names* to these several principles, the idea was taken from the practice of the *House of Commons*, in their *Votes*, as copied or imitated in the *newspapers*, in relation to *Bills* when spoken of on the occasion of their progress in the Houses. Any names less uncouth and more expressive, will, if suggested, be gratefully received, and gladly substituted. It is only by giving thus to *each* its *particular* name, (viz. in the form of a compound substantive or adjective,) and to *all* one *common* name, viz. *principles*, that the arrangements could be employed, by which the particular *ends* and *uses* common to each class, and the sort of *relation* borne by each principle to *every other*, and thence to the *whole system*, are, as here, brought together in one point of view; and thereby the whole system exposed in the most commodious manner to that scrutiny, by which, in proportion as it is close and intimate, the perfection of the system will, it is believed, be rendered manifest.

(1.) [*Scholar Teacher Principle.*] The principle, which consists in employing, as *teachers* to the rest, some of the most advanced, and in other respects most capable, among the *scholars* themselves:—*maximizing* the use and application made of this principle; i. e. giving to it the utmost extent capable of being given to it with advantage:—raising it to a *maximum*. In this *maximization* consists the only peculiarity, and correspondent utility, of this part of the system.—*Advantages* gained, I. *Saving in money.* Every *professional teacher* would need to be paid; no such *scholar teacher* needs to be, or is paid. II. *Saving in time.* Under the inspection of one *professional General Master*, the whole number of Scholars may be cast into as many classes as there are different *branches of instruction*, and different *degrees of proficiency* in each: each such class under the direction of its *Scholar Teacher;* the instruction of all these classes going on at the same time. III. *Increase in relative aptitude.* 1. For securing the attention of a *grown* person in the character of *Teacher* to such business, especially in the case of those lowest branches, which form the occupation of children but just emerged from infancy, the nature of the case scarce admits of any other generally applying motive than *fear;* viz. the fear of losing the *situation;* i. e. the *provision* annexed to it. In it he can find neither *instruction, amusement,*

nor, except that fear, any other cause of *interest*: his attention is perpetually called off by such *other* ideas, whatsoever they may be, in which, for the moment, it happens to him to take an interest. In the breast of the *Scholar Teacher*, the *honour* and *power*, attached to the function, cannot fail of operating in the character of a *reward*; of a reward, the operativeness and sufficiency of which has been proved by an ample and uninterrupted body of experience. Instead of being so completely *stale* as in the other case, the *subject*, contemplated in this new point of view, is not yet become so familiar as to have lost altogether the sort of *interest*, which, particularly in a juvenile mind, is attached to *novelty*:—especially, coupled as it is with the situation of *judge*, presiding on the occasion of the contest, produced by the application of the *place-capturing* principle, No. (10). 2. By his age and situation, the *juvenile*, and completely subject *Teacher*, is, to a certainty and constancy, rendered more tractable, than a *grown-up under-Master* can ever be reasonably expected to be. On each point, the *grown-up Teacher* is liable to have an *opinion* of his own, and with it a *will* of his own, contrary to that of his superior and employer: to which *will*, at any rate during the *absence* or *inattention* of such his principal, it is in his power to give effect. To the juvenile and subject *Scholar-Teacher*, this can never happen. The *professional under-Teacher*, be his negligence or perversity what it may, cannot be subjected to any other *punishment* than that of *dismissal*: a punishment, by the infliction of which, it will frequently happen, that the *judge* would be no less a sufferer than the *delinquent*. IV. By teaching *others*, the scholar is, at the same time, teaching *himself*: imprinting, more; and more deeply, into his own mind, whatsoever ideas he has received into it in the character of a *learner*: taking of them, at the same time, a somewhat new and more commanding view, tinged, as they are, with an enlivening colour by the associated ideas of *reputation*, and of that *power*, which has been the fruit of it.

The application of this principle is, therefore,—not a *make-shift*, occasionally employed, as under the old system, for want of a sufficient supply of *grown-up* under-Teachers,—but an *essential feature*, operating to the complete and *purposed* exclusion, of all such naturally reluctant and untractable subordinates.

But the faculty, of giving to this principle any such extension *to advantage*, depends, in no inconsiderable degree, on several *other* parts of the system: viz. on the *simplicity*, and thence on the *shortness*, of the *lessons*, as per No. (31.); on the *extent* to which the practices of *repetition* and *responsion* in *terminis*, (Exercises, No. (5.) and (7.) can be applied to advantage, and thereupon to the extent to which, in the

character of a *test* of *intellection*, as per No. (24.) and (25.), their *checks*, viz. the *organic* species of exercise, and the *note-taking* exercise, can be employed: and, in so far as responsion in *purport* is either extracted or received, the allowance given to eventual *appeal*, as per No. (11.), from the decisions of the juvenile under-Teacher to the Master—the supreme and universal judge.

(2.) [*Contiguous proficiency principle.*] On this sort of contiguity depends, as hath just been seen, no small part of the advantage, which the case of the *Scholar-Teacher* has over that of the *grown-up Teacher*: but, the higher advanced in the line of proficiency the *Scholar Teacher* is above his pupils, the nearer does his situation approach to that of *grown-up Teacher*: *honour* less, *power* less gratifying, *instruction* and *amusement*, if any, less and less. At the same time, what may not unfrequently happen, especially in the case of the lowest classes, is —that at an age, at which, in respect of proficiency in *learning*, he is ripe for the office, the Scholar is not so as yet in respect of the faculty of *discretion*, or that of *judicature*. So far as, in respect of these latter qualifications, a deficiency has place, so far *a departure* from the *contiguous proficiency* principle may be found necessary.

(3.) [*Scholar-Tutor principle.*] The Scholar-*Teacher* delivers the directions to the *whole number* of pupils in a class at once: he presides over the *probative*, and in particular over the *recitative* and *responsive* exercises, Nos. (5.) and (7.), performed *by all together*, under the spur of the *place-capturing* principle, No. (10.):—exercises, by the performance of which the several lessons are *said*. By the Scholar-*Tutor*, assistance is, in case of need, afforded to some *one* other Scholar, attached to him for this purpose in the character of a *private pupil*, during the several portions of time, allotted for the *getting* of the respective lessons. The local station of the Scholar-*Teacher* is, consequently, a distinguished and *solitary* one; that of the Scholar-*Tutor* is a *social* one, just by the side of his *pupil*. The less the degree of general capacity on the part of the *pupil*, the greater is the degree of the like capacity needful on the part of the occasional *assistant*. On this principle it is, that the operation of *pairing* is performed. Suppose, in one class, *eleven Scholars*, and to each a different degree of capacity, for this purpose, ascribed: he who has *eleven degrees* is paired with him who has but *one*; he who has *ten* degrees, with him who has *two*: he who has *six* degrees remaining single.

(4.) [*Scholar Monitor principle.*] Of this office—an office of indispensable necessity in all large schools upon the ordinary plan—little or no need will probably be found, on the plan of architectural construction prescribed by the *Panopticon* principle, No. (9.), by which

every human object in the whole building is kept throughout within the reach of the *Head-Master's* eye.

[*Master's Time-saving principle.*] The *Managing* Master is but *one*: to the number of the *Scholar*-Masters there are no limits, but what experienced convenience dictates. Whatsoever can be equally well done by any one or more of *them*, *his* time would be very ill employed in doing or endeavouring to do. General inspection and direction is the business which *must* be done by *him*, and *cannot* be done by any one else: whatsoever time is by *him* employed on any *other* business, the danger is, lest it be taken from that which is necessary to the performance of his *peculiar* business, as above.

(6.) [*Regular Visitation principle.*] The operation of this sort of tribunal is an advantage, which a school, instituted and supported by *contributions*, possesses in comparison of an ordinary school. By the schools, carried on under the superintendence of the Society called the *National Society*, it may in general be expected to be possessed, in a degree more or less considerable, according to *local* circumstances. By the *Chrestomathic* School, it may reasonably be expected to be possessed in a still superior degree, the superiority of which will be proportioned to the ulterior *interest* possessed by the Conductors in this case, in *addition* to that possessed by the Superintendants in that other case. But the means which the Visitors, be they who they may, have for the execution of their trust to advantage and with effect, depend almost altogether upon the principles, Nos. (13, 14, 15, 16,) respecting *Evidence*: the good effects producible by the *judgment* which, on each occasion, they *pronounce*, and the *arrangements* which they *make* in relation to what *is to be* done, are completely dependent upon the *knowledge* which they possess, upon the *information* which they have received, concerning what *has been* done.

(7.) [*Punishment minimizing principle.*]

(8.) [*Reward economizing principle.*] Two intimately connected principles, both of them of cardinal importance, may be seen, in the idea and practice, of setting up these *results* in the character of *ends* or *objects* to be aimed at: these, together with the several *maximizing* principles, Nos. (1.) (3.) (13.) (14.) (22.) (23.) (24.) (25.) (26.) (31.) (37.) and the several *promisory* principles, Nos. (17.) (19.) (30.) (32.) (33.) may be considered as so many branches of that all-pervading principle, so peculiar to this system, by which *perfection*, on every point, the idea of it having been conceived, is represented as *capable of being*, and therefore as being what *ought to be*, obtained. To give effect to these *two* principles is the *object* and *effect* of the *four others* which, in this same division, follow them.

Facility of *delinquency*, *inapplicability* of *reward*, *uncertainty* of the *forthcomingness* of *evidence*,—and thence of the application of whatever of *punishment* or *reward* may be intended to be administered,—as those several quantities *increase*, so does the *quantity* (i. e. the *intensity* or *duration* of the *punishment*, necessitated: in proportion as any of these quantities *decrease*, so (if nothing be wrong in the system of judicature) may the *quantity* of *punishment* denounced and applied: always understood, that punishment is *no* punishment, unless, supposing it inflicted, the *suffering* produced by it is, in the eyes of *the person under temptation*, *greater*, than the *enjoyment* expected from the *offence*. By the application made of the *Inspection principle*, No. (9.) and the *Scholar-Tutor principle*, No. (3.), the *facility* of delinquency is, in all its shapes, nearly done away: by the *Short Lesson principle*, No. (31.) the *pain* of *labour*, and thence the *pleasure* afforded by *delinquency* in the shape of *idleness*, is *minimized* by the *Place-capturing principle*, No. (10.), *reward* to the well-doer is rendered, *so far*, a constant accompaniment of the gentle *punishment*, brought on the offender by the offence: by the principles respecting *evidence*, Nos. (13.) (14.) (15.) (16.), operating in conjunction with the *Inspection principle*, all uncertainty respecting *evidence* is done away.

As to *reward* but for the apparent paradoxicality and antisentimentality, instead of *economizing*, *minimizing* would, in this case, as in the case of *punishment*, have been inserted. For (perfectly free donations excepted) never can the matter of *reward* be obtained, to pour into *one* bosom, but at the expense of *suffering*, however remote and disguised, inflicted upon *others*. Neither in *power*, in *dignities*, in *honours*—no, nor even in simple *reputation*, will any exception be found to this rule. Therefore it is, that, in a government, though tyranny may exist without profusion, profusion cannot exist without correspondent tyranny.

(9.) [*Inspection principle.*] In the *Bell-Instruction* System in general, in virtue of the *Scholar-Teacher*, &c. principles, Nos. (1.) (3.) (4.), and the *Master's time saving principle*, No. (5.), with or without *locomotion* on the part of the Master, this object, it may be reasonably supposed, is nearly accomplished: though, in so far as concerns inspection by the Master, the degree will naturally be less and less, in proportion as the *School-room* is more ample, and by that means drawn out into *length*. By the *Panopticon* principle of construction, security, in this respect, is *maximized*, and rendered entire: viz. partly, by *minimizing* the distance between the situation of the *remotest Scholar* and that of the *Master's eye*; partly, by giving to the *floor* or *floors* that *inclination*, which, to a certain degree, prevents remoter objects from being

eclipsed by nearer ones; partly by enabling the Master *to see without being seen;* whereby, to those who, at the moment, are unseen by him, it cannot be *known* that they are in this case. In the *Chrestomathic* School this plan of construction is of course to be employed.

(10.) [*Place-capturing principle.*] On the occasion of the *saying* of a lesson, whatever it be, the scholars, by whom that same lesson has been *got*, are placed, or are kept, standing or sitting, in one line, straight or curved, as is found most convenient; with an understanding, that he whose place is at one end of the line, is considered (no matter on what account) as occupying, at the time, the post of greatest *honour;* the one whose place is next to his, the post next in honour; and so on. The *highest* scholar, as above, begins to *say* the lesson: in case of an error, the *next highest*, on giving indication of it, takes, in pursuance of an instantaneous adjudication, the *first place*, which the *sayer* of the lesson is, in punishment for such his delinquency, adjudged to lose: failing the next, the next but one; and so on to the lowest. By this means, the *intellectual* exercise, be it what it may, is, like most of those *corporal* exercises in which youth are wont to occupy themselves for mere amusement, converted into a *game: punishment* attaching instantaneously upon *demerit*, and, by the same operation, *reward* upon *merit*, and, in both cases, without further trouble or expense in any shape.

(11.) [*Appeal providing principle.*] viz. from *Scholar-master* in any one of these his three characters, *Public-teacher*, *Private-tutor*, and *Monitor*. For this appeal, the principal, and, indeed, almost sole demand, will be found to be that which is capable of being constituted by the application of the *Place-capturing* principle, (No. 10.): especially where, on the occasion of the *probative* exercise to which it is applied, either *no fixt verbal standard of reference*, as per No. (23.) is employed, or where, this sort of standard being employed, *literal conformity* to it is *not* exacted. The greater the *latitude* allowed to performance, the greater the room for *error*, and *suspicion* of error, in whatsoever judgment may happen to have been passed upon it.

(12.) [*Scholar Jury principle.*] *Advantages.* 1. The *Master* stands hereby preserved, in a great degree, if not altogether, from the suspicion of *partiality* and *tyranny*. 2. By the necessary solemnities by which the application of the *punishment* is thus preceded, the attention of the *scholar* is more firmly fixt upon it, and the idea of it rendered the more impressive. 3. The scholars are, at this early age, initiated in the exercise of the functions of *judicature*, as well as in the *knowledge* of what belongs to *justice*, while the *love* of it instils itself into their breasts. 4. The tendency, so natural amongst persons of any age subject to coercion, to unite in a sort of *standing conspiracy* against

those by whom they are kept under that pressure, is counteracted and diminished.

(13.) [*Progress Registration principle.*]

(14.) [*Comparative Proficiency principle.*] Every *lesson* being taken from some determinate *book*, the designation of every *exercise* is performed and perpetuated by *reference* made to that part of the book which has been the subject of it. On each day—of the *lessons* which, on that day, have, by the several *classes*, been *got* and *said*, together with the *organic* exercises, No. (24.), if any, which have been *performed*, the designation is given, by entries made in the *Aggregate* Register: and, at the same time, the name of each *scholar*, present or absent belonging to each *class*, together with the *rank* which, as the result of the *place-capturing* contest, No. (10) of *that* day, or the last on which he was present, has remained to him in his class. The *Comparative proficiency* Register contains a distinct *head* for each scholar. It exhibits, for any portion of *time*, the *class* he has belonged to, and thence, as above, the *lessons*, which in that class he has got and said, and the *organic exercises* which he has performed, and the *rank*, which, putting *all* the days together, he has occupied in such his *class*. Thus his account is formed, by copying from the *Aggregate* Register, and summing up, the *numbers* expressive of the *rank*, which he has been found occupying on the several *days* included in the term: the *less* the sum, the *higher*, of course, his rank, taking the whole of the term together. If, for a certain length of time, he is at or near the *top* of the class, it will be a sign, that he is quite or nearly ripe for removal to a *higher* class; and, in the mean time, that he is, to a certain degree, qualified for lending assistance, upon occasion, in the character of *Private Tutor*, as per No. (3) to a *class-fellow*, whose degree of *proficiency*, as indicated by the same document, is, in a correspondent degree, *inferior* to his own: and, in like manner, in proportion as the sum is *large*, the correspondent and *opposite* indication is afforded. Thus it is, that this *Register* forms the basis of the application made of the *Scholar-Tutor* principle, No. (3) as well as of the *apposite-classification* principle, No. (30).

(15.) [*Delinquency Registration principle.*]

(16.) [*Delation exacting principle.*] By the *Aggregate Progress* Register, No. (13), so far as concerns such *transgressions* as are of a purely *literary* cast, the *balance*, formed by the sum of the several acts of *transgression*, compared with that of the correspondent manifestations of *merit*, stands recorded: and, upon this plan of *in*struction, and *con*struction, as per No. (9), seldom, indeed, in any *other* than a literary shape, can delinquency find entrance. By a person, in whose eyes an

offence, which he feels himself under the temptation of committing, is sure to be immediately followed by a *punishment*, the sufferance of which is sure to be greater than the enjoyment from the offence, the offence will not be committed. In an *edifice*, in which nothing can be done that is not, at the same time, certainly by an *under* master, and probably by the *Head* master, seen *while doing*, scarcely will any forbidden act be committed. Punishment, eventual punishment, must, notwithstanding, be appointed; otherwise mere *sport* and *wantonness* would, as well as *idleness*, suffice for the production of offences. But, in such a state of things, a punishment of the *slightest* kind and degree imaginable, will, it is evident, suffice. The bare assurance that his *name* will, in the character of that of a *delinquent*, be made to stand upon the face of a durable and more or less extensively published *Register*, may, in the instance of almost any human being, old or young, as experience, in confirmation of theory, testifies, be depended upon, as being, *in such a situation*, of itself a sufficient punishment. At the same time, for appearance sake, bodily uneasiness, in this or that *slight* shape, may stand appointed; and with the less scruple, on account of the moral certainty of its being seldom, if ever, about to be inflicted. As to the *Universal Delation principle*, under *Dr. Bell's* system, every *scholar*, especially if acting in the character of *Teacher*, *Tutor*, or *Monitor*, is *responsible* (i. e. *punishable*) for every instance of *delinquency*, of which, it having been committed in his *view*, or otherwise within his *knowledge*, he has omitted to give information to the *Master*; and, where the *heaviest punishment* that can be the result of such information is but as a *feather*, such, therefore, will this *obligation* be. Light, as under that system it cannot but be, even where the scene is an *ordinary* school room,—in a school room in which, as per No. (9), every thing is no sooner *done* than *seen*, it will be still lighter.

(17.) [*Proficiency promising principle.*] *Performance*, it may here seem, is every thing: *promise*, of itself, promise, without performance, nothing. True, if *without* performance: but it is the nature of promise to operate as a *security* for performance. Hence the laying it down as a *rule*, that *no* scholar shall be considered as *incapable* of imbibing the instruction which is administered, is itself a most important *principle*. It operates as an *engagement*, upon all concerned. True it is, that if, *without blame* on the part of the engager, the fulfilment of the engagement were liable to be defeated—or even if, *by reason of blame* on his part, it were, to a certain degree of frequency, *likely* to be defeated, the engagement ought not to be administered. But that, under the *Bell Instruction* System, such fulfilment is, in every instance, in the *Master's* power,—is a truth, indicated by theory, and confirmed

by experience. By this principle, such perfection is pointed out as a *producible*, and, therefore, *exigible* result. So far as concerns the already established *lower* stages of instruction, it stands confirmed by every publication which the subject has produced: of its extension to those *higher* stages, which are included in the *Great Grammar schools*, proof will be found in the *letters* of *Mr. Pillans* and *Mr. Gray*, mentioned or inserted in the *Chrestomathoscopia*, or its Appendix. In the remaining principles, belonging to this division, Nos. from (18) to (30), may be seen the several *means immediately* operating towards so desirable an end.

(18.) [*Non-conception presuming principle.*] By this principle as brought to view in the works of *Dr. Bell*, reference is made to a practice, which, among *masters*, is so *natural*, and is said to be so *common*,—viz. to keep *repeating*, on each occasion, their instructions, instead of taking the earliest opportunity for *ascertaining* whether, by the pupil in question, these instructions have been *comprehended*. But, under the *Bell Instruction* system, and, in particular, under the extended application here proposed to be made of it:—1. In the first place, the matter of instruction being throughout *determinate*, and *in print*, the demand for such *intermediate* discourse, on the part of the *master*, will hardly have place:—2. In the next place, no discourse in the form of *instruction* being admitted, but that the most efficient *tests of intellection*, as per Nos. (10.) (22.) (24.), such as the nature of the case admits of, are provided and applied to it,—the *danger of transgression*, and the consequent *demand for application*, will, in the instance of this rule, be proportionably inconsiderable:—and, 3. The *greater the number* of the scholars, learning under the direction of *one Head Master*, the fuller the assurance that, by the perception of *impracticability*, under the warning given by this principle, he will be kept from the attempt.

(19.) [*Perfect Performance exacting principle.*] In this may be seen one of the necessary means, without which the engagement taken in virtue of No. (17.) cannot be fulfilled. It will itself be seen to have for its true principal and most immediate supporters, the *Short Lesson principle*, No. (30.), and the *Apposite Classification principle*, No. (31.) By the *Short Lesson principle*, provision is made, that the *earliest*, i. e. the *least difficult* lessons, shall be so *easy*, that the dullest capacity cannot fail of *comprehending* them, or the slowest fail of learning, sooner or later, to *perform* them; i. e. to *get* them within the allotted length of time. By that *probative* species of exercise, the uniform application of which is prescribed by Nos. (23.) and (24.), under the influence of the *Place-capturing principle*, No. (10.), it will, by means of the indication

afforded by the *progress*, and *Comparative proficiency* Registration *principles*, Nos. (13.) and (14.), be seen how soon, under the spur of the *Place-capturing principle*, No. (10.), he is become sufficiently *perfect* in his *performance:* and, till he is so perfect, be his age what it will, he will, in virtue of the *Apposite Classification principle*, be kept in that *same* class, without advancement to a higher; continuing to be thus *taught*, until he has *learnt*.

(20.) [*Gradual Progression principle.*] The use of this principle is—to operate as a sort of *memento:* and thence, in the first place, on the part of the planners of the system of *exercises*—in the next place, on the part of the *Masters*, by whom they are to be applied and carried into effect, to render the transition,—from an exercise easier, and lower in specie or degree, to the next succeeding exercise,—as *gradual*, and, as it were, as *insensible* as possible. Of the degree of regard paid to this principle—of this, as of every other material circumstance—information will be given to *Visitors* as well as *Masters*, by the *Progress Register*, No. (13.) Supposing the rule transgressed, the *wider* and more *frequent* the instances of transgression, the more *manifest* will they be rendered: viz. in the first place, to the *Scholar Teacher*, by means of the numerous transgressions manifested under the *Place-capturing principle*, No. (10.), on the *saying* of the *lesson*;—in the next place, to the *Visitors*, as well as to the *Master*, by means of the *sudden downfall* of one or more of the *scholars*, whose rank had, till this time, been among the most advanced.

(21.) [*Adequate Recapitulation principle.*] In so far as the substance of any antecedent lesson is forgotten, especially in so far as the *remembrance* of an *antecedent* is necessary to the *intellection* of a *subsequent* lesson, the time employed in *subsequent* ones will have been expended with little fruit, and progress and proficiency will be more *apparent* than *real*. As it stands here, the *use* of the principle is—to serve as a *memento:* the *application* of it must depend—partly on the nature of the *branch of learning* in question, partly on the nature of the *exercise*. In this view, the most *favourable* state of things is that which has place, in so far as, between what has *gone before* and what *comes after*, the *connection* is so *intimate*, that a *subsequent* lesson cannot be *said* or *got*, but in proportion as an *antecedent* lesson is *remembered*. For its antagonist and necessary *check*, this *memento* has that which is conveyed by a succeeding principle:—viz. The *Needless Commoration prohibiting principle*, No. (36.)

(22.) [*Place-capturing probative Exercise maximizing principle,*] and (23.) [*Literal Conformity maximizing principle.*] On the constancy of the application made of the correspondent *probative* exercise, by which

a lesson is *said*, depends all the use derivable from any *mathetic* exercise, by which that same lesson is supposed to be *got*. On the effect produced by the exciting and invigorating influence of the *Place-capturing* process, No. (10.), depends, in a prodigious degree, the effect of every *probative* exercise. In the *greater number* of schools of the *higher* class, no use at all *is* made,—nor indeed, for want of a sufficient number of scholars in a class, *can* be made,—of the *Place-capturing* process, No. (10.): in no *one* school is the use of it *maximized*. In the *Chrestomathic* School, it *will* be maximized. But it is only in so far as it is performed with reference to a *verbal standard*—and *that* prescribed *in terminis*,—*literal* conformity to that standard being at the same time exacted,—that the process can be employed to the best advantage. In this case, the only danger is, *absence* of adequate *intellection:* but, against this danger, provision is here made by the *Organic Exercise principle*, No. (24.), and the *Note-taking principle*, No. (25.) In so far as application is made of the *Literal Conformity principle*, the function of *Scholar Master* is capable of being exercised by any scholar, to whom the *verbal standard*, employed on the occasion, is *legible*. Hence, the more extended the application made of this *Literal Conformity principle*, the greater the extent, to which the *Scholar Master principle*, No. (1.), is applicable with the most unquestionable *advantage*. Mr. *Lancaster* seems to have been the first, if not the only person, to whom this advantage has presented itself in so strong and clear a point of view. Applied to *arithmetical* exercises, the *text* of the *verbal standard* is by him styled the *Key*. *Lanc. Improvements*, p. 84.

(24.) [*Organic Intellection Test principle.*] For the importance of *maximization* in this case, see No. (23). While delineating the objects of the several *sciences*, with their concomitant and correspondent *arts*, the pupil, at the same time, makes *proof* of the *proficiency* he has attained in the *science*, and improves himself in the imitative *art*.

(25.) [*Note-taking principle.*] By this *exercise*, no *art*, except that of *writing*, being practised, no such composite *proficiency* is produced, as in the case last mentioned. But in the character of a *test of intellection*, it is not only applicable, to an *extent*, to which, in respect to the magnitude of the *field of instruction*, there are no limits, but, wheresoever applied, it stands free from those *limitations* which apply to the *graphic* art. Even in the application to the *mechanical* part of the art of writing, it is not without its use; being, though frequently at the expense of *beauty*, conducive to *dispatch*. Being of so purely intellectual a nature, —a species of extempore *composition*,—it is among the *highest*, and, consequently, *latest* exercises, which, under such a system as the present, can with propriety be exacted.

(26.) [*Self-service principle.*] This principle is, in its *nature*, the same with the *organic exercise* principle, No. (24.) but, in its *application*, extended to those operations, which, though themselves not belonging to the art in question, yet, being subservient and accessary preliminaries to the exercise of it, have been in use to be performed, by hands other than those of the Scholars themselves. *Examples:*—in the case of *writing*, *mending* the pen, *ruling* the paper: in the case of *drawing*, *adjusting* the pencil, and other instruments employed. In ordinary schools, to save the trouble of teaching, these subservient operations are frequently performed by the *Master*, or his adult assistants. In the *Bell-Instruction* system, a point is made of including them in the system of instruction, and causing them to be learnt and performed by the *Scholars*, for themselves. But the expense produced by *spoilage*, during the teaching, is, a counter-consideration, which must not be neglected. Here *instruction* and *pecuniary economy* are at variance: and some how or other a compromise will be to be made.

(27.) [*Task Description principle.*] This principle may be considered as a particular application and exemplification of the one just mentioned. Those given under that former head belong to the class of *manual*, *this* to that of *vocal* exercises. By the practice of thus proclaiming, on the occasion of each fresh lesson, according to a prescribed rule, a description of the lesson last *said*, and of the lesson about to be *got*, one or both, reference being had to their respective places in the book from which they are both taken, the Scholar learns to fix his *conceptions* of the *objects* with which he has to do, and to give *clearness* to the *ideas* which he abstracts from them.

(28.) [*Tabular Exhibition principle.*] The all-comprehensive object is, *to maximize* the quantity of useful instruction, imbibed in this receptacle, during the allotted time. Towards the accomplishment of this object, by the aggregate of the several exercises, *mathetic* and *probative* taken together, every thing is endeavoured to be done which can be done, every portion of time to be occupied which can be occupied, by the performance of *prescribed* exercises. Remain, however, some *fragments of time*, for the occupation of which no *prescribed* exercises can serve. These are, in the case of all the Scholars, the moments intervening between the *entrance* of each Scholar and the *commencement* of the process of instruction, and the moments intervening in like manner between *conclusion* and *departure*: and, in the case of the quickest conceptions, the moments intervening between the time *actually employed* in the getting of each lesson, and the end of the whole length of time *allotted* to the getting of it. Of the sum of all these moments is constituted the quantity of *free time*. During this time, the

business—is so to order matters, as to afford the best *chance* at least, that, in the instance of each Scholar, this portion of *free time* shall spontaneously be filled up, by some *occupation*, that shall be conducive to the universal *end*. For this purpose the principle prescribes the following rule—

Rule.—Whatever part of the interior of the building is exposed to the view of the Scholars, keep it covered with *the matter of instruction*, in some shape or other: viz. in the shape of *verbal didactic discourse* in print, or *graphical imitations*, or, in some instances, the *things themselves*. At the very earliest stage, *biographical charts*, *historical charts*, and *maps*, will, in this way, be coming into use. Even at this stage, tabular views of the *fields* of some of the branches of learning, exhibiting their principal divisions,—*Botany* and *Zoology*, in particular,—may, with advantage, be kept in view: provided always, that every occasion be taken for illustrating the *verbal* description by *graphical* imitations.

(29.) [*Distraction preventing principle.*] Neither in respect of the quantity of *regulated time*, nor in respect of the quantity of *free time*, as above, will this design of useful occupation be carried into effect, any farther than all other *sensible objects*, such as, if admitted, would afford to the moment a more *attractive*, and thence a *distractive*, occupation, stand *excluded*. For this purpose, the principle affords the following Architectural *Rule:*—By height, or otherwise, so order the windows, that, so far as such exclusion can be made consistent with the admission of a sufficiency of light, no object, *exterior* to the building, shall be *visible* in any part of it occupied by the Scholars. To this rule, attention seems to have been not unfrequently paid in the construction of *School rooms*.

(30.) [*Apposite Classification principle.*] If the class, in which the scholar is placed, is *not high enough* for his attainments, his advancement is not so rapid as it might be; and in this shape, in this instance, *perfection* fails of being attained: if *too high* for his attainments, the case is much *worse*. Whatever be the subsequent and more *advanced* train of instruction, to his possession of which this or that article of *antecedent* instruction, which he has failed of possessing himself of, is necessary, all this is so much *lost* to him: in respect of all this, he is, by this prematurity of advancement, condemned to remain in *ignorance*. Of the *Aggregate progress*, and *Comparative proficiency*, *registration principle*, Nos. (13) and (14), one good effect is, as hath been seen, the furnishing, in so far as the *evidence* so afforded is looked at and applied to the purpose, the most complete security against the opposite, but widely unequal mischiefs just described.

In an ordinary school, the *number* of the *classes* being generally *fixed*,

and the *boundary lines*, between *class* and *class*, also fixed, (being determined by the nature of the *exercises*), *removal* from a higher to a *lower* class is regarded as a serious *disgrace:* thence as a tremendous punishment; and consequently not employed, but under the notion of serious and obstinate *delinquency*. After a certain length of stay, *non-advancement* is considered nearly in the same light: fit or unfit, having learnt every thing, or having learnt nothing, sooner or later, *every* scholar is accordingly advanced. This same bad effect—will it not therefore have place under the *new* system? No:—because, under this system, the *hold* which each scholar has upon the *class*, which, but for the removal, he belongs to, is, from first to last, understood to be as *loose* as the hold, which, under the operation of the *place-capturing principle*, No. (10), he has upon the *place*, which, for the same moment, he occupies in the class. Moreover, a scholar belongs to *as many classes*, at the same *time*, as there are different *branches* in which he receives instruction: *put back* in one, he may, at the same time, be *advanced* in another: and, at any rate, the idea of degradation,—utter and complete degradation,—is not produced by his being put back in any number of those branches, short of the *whole*.

(31.) [*Short Lesson principle.*] The longer the *lesson* is, the longer must be the *time* allowed—allowed to all—for *getting* it, and the less strong the assurance that it will be gotten by that time. As, in a *fleet*, the pace of the slowest, so in class, the pace of the *dullest*, *vessel* is necessarily the pace of the *whole*. If the lesson be of such a length that, upon calculation, *an hour* is in that way requisite for the getting it, here is a whole hour, which, by any number of the scholars, may be consumed in *idleness*, and *that* before the deficiency is discovered. If the length be no more than *ten minutes*, (and this, under the *Bell Instruction* system, is the *maximum*), thus much shorter is the *maximum* of *idleness* for that time: not that, under the sense of the, at any rate, so nearly approaching moment for *saying* the lesson—and *that* under the spur of the *place-capturing* principle, No. (10),—a *yoke mate*, in the character either of *scholar tutor*, or *scholar tutor's pupil*, being all the time at the scholar's side,—any such *voluntary* inaction ever does or can take place. But, between the conclusion of the time *allotted* to *all alike*, for the getting of a lesson, and the time which, by the *quickest* minds, is actually *found* needful for the getting it, there will always (see *Tabular Exhibition principle*, No. (28,) be an interval not occupied in any *exercise;* and, upon reflection, it will be found that the magnitude of the *sum* of these *unoccupied intervals* will naturally be, not *directly*, but *inversely*, as that of the *number* of the *lessons*. The *shorter* the lesson is, the easier it will be to ascertain, and thence to retrench, any *super-*

fluity in the quantity of the *time*, which may, in the *first* instance, have been *allotted* to it.

(32.) [*Simultaneous Action principle.*] For the use of the *promise*, see No. (17). During the performance of the *probative* exercise, i. e. during the *saying* of the lesson, under the operation of the *place-capturing principle*, No. (10), the *simultaneity* is the *necessary* effect of the *exercise*: while some *one* is employed in *saying* his part of his lesson, all the *rest* of the class are employed in *watching him*, for the purpose of making their advantage of his transgression.

(33.) [*Uninterrupted Action principle.*] During the whole of the school-time, the scholars are, all of them, employed, either in simply *mathetic*, in simply *probative*, or in *organic* (i. e. *mathetico-probative*) exercises—in *getting* lessons, *saying* lessons, or in *drawing* or *writing* the subjects of lessons. In passing from one such exercise to another, no *interval* worth mentioning need, or will, take place: the *organic* exercise will be *performed*, and the *transition* from one exercise to another *effected*, under direction, given by *words of command*, as No. (34), or *visible signals*, No. (35).

(34.) [*Word of Command principle.*]

(35.) [*Visible Signal principle.*] The application of *words of command* to *school* instruction, appears to have been the invention, and that a highly useful one, of *Mr. Lancaster*. [Bernard, p. 171.] As saving *noise*, the *visible* sort of signal, in so far as applicable, is manifestly preferable. It is only, however, by *audible*, and not by *visible* signs that, in such a situation, *perception* and *attention* can always be made sure of.

(36.) [*Needless Repetition prohibiting principle.*] Being obstructive of *dispatch*, the imperfection thus designated belongs to this place. In the character of a *memento*, the principle may serve as an *antagonist* to, and *check* upon, the *recapitulation principle*, No. (21).

(37.) [*Memoriter Metre principle.*] In affording assistance to the *memory*, the use of *metre*,—whether, (according to the nature of the language,) with or without *rhyme*,—is pointed out by theory, and amply confirmed by experience. No *reason* can be assigned why this assistance should be refused to any branch of learning. The cause why as yet it has been confined to *language-learning*, and principally, if not exclusively, to the *dead* languages, is,—that, on the *revival of literature*, instruction being nearly confined to those, at that time, most instructive languages, the ingenious men, who, for the use of non-adult and *non-self-directing* minds, afforded their assistance to *language-learning*, were not in a situation to carry it any farther. But, according to the persuasion, by which the *present* plan has been governed, there exists not that branch of *useful intellectual learning*, which may not, with full as

good effect as *language-learning*, be administered to the juvenile mind, long before its arrival at the *self-directing* state.

(38.) [*Employment varying principle.*] In proportion as exercises are varied, each affords relief, and operates as a sort of recreation or play, with relation to every other. In the Bell Instruction System, confined as in its application to art and science it has hitherto been, within such narrow limits, the indication of the advantage attached to such a diversification, might require to be held up to view in the way of Memento. Under any such extension as the one here proposed, it will take place of course.

(39.) [*Distinct Intonation principle.*]

(40.) [*Syllabic Lection principle.*]

(41.) [*Unreiterated Spelling principle.*]

(42.) [*Stammering Repetition prohibiting principle.*] The names here ventured to be assigned to these several principles, will, it is hoped, contribute something, if not to the *conception*, to the *remembrance* at least of their import. For more particular explanation, room cannot be afforded here. By *Dr. Bell*'s works, not to mention those of his followers, no demand for it has been left. By *balbutient* is meant a species of *stammering*. Every such disorderly *repetition*, being considered as a *transgression*, is, of course, *punished* as such, and thus presently *corrected*, under the spur of the *place-capturing principle*, No. (10.)

(43.) [*Psammographic.*] From two Greek words, one of which signifies *sand*, the other *writing* or *belonging* to *writing*. The advantage attached to the use of *sand* consists—not merely in its *cheapness*, but also in the *facility* with which characters may be traced in it, at an age too *early* for the use either of *pen* or *pencil*; add the superior *magnitude* which may conveniently be given to the *characters*, and the *alacrity* produced by the comparative *freedom* which it affords to the feeble and as yet untaught hand. (See Bernard, p. 170.)

The *principles*, if such they may be called, belonging to this division, *Dr. Bell* distinguishes from the rest by the less imposing name of *Practices*. *Inferior* to *all the other* principles, in one sense of the word, *extent*, viz. as designative of the *number* of the *branches* of *instruction* to which they are applicable, they are, in relation to *some* of those principles, *superior*, in a still more important sense of that same word, viz. as designative of the *number* of the *persons*, to whom the benefit of that instruction is capable of being imparted. The use of the word *principle* is—to serve as a common appellative, and thence as a common *bond of connexion*, for every *efficient cause*, by the operation of which, it is supposed, that the accomplishment of the *common end*,—*the communication of useful intellectual instruction*,—may be promoted. With the word

exercise it is here connected, by exhibiting, in the character of a *principle*, the intention to employ, or bring to view as capable of being with advantage employed, as a *means* to that common end, this or that species of *exercise:* so many species of *exercise*, so many *principles*, over and above those which have no such immediate application to *exercises*. As to the *operations*, to which, as above, the common name of *practices* has been attached by *Dr. Bell*, they seem to consist of certain improved *modes* of performing the sorts of *exercises*, by the performance of which, the arts of *pronunciation*, *reading*, and *writing* are acquired. If this be so, so many of these modes as are distinguishable from each other, so many correspondent articles may, in this way, be added to the catalogue of *principles—intellectual-instruction serving principles*.

In relation to several *particular* branches of *art* and *science*, several such *principles* (chiefly consisting in the suggestion of as many *exercises*), besides those of which intimation is given in the course of this Table, have, at different times, presented themselves to the author; and among them some, the expected utility of which has received confirmation from private trials But the time (it seemed) was not yet arrived, in which they could, with propriety, be added to, and, as it were, put upon a level, with the contents of a whole *system of principles*, the utility of which has received such ample confirmation from experience.

J. M'Creery, Printer, Black-Horse-Court, London.

APPENDIX TO CHRESTOMATHIA.

No. I.

**Chrestomathic Proposal: being a proposal for erecting by Subscription, and carrying on by the name of the Chrestomathic School, a Day-School for the extension of the new system to the higher branches of Instruction and ranks in life.*

I. *Occasion of this Address.*

THE matchless excellence, as well as novelty, of the *New Instruction System*, is a matter too universally recognized, to need mention in any other way than that of simple allusion. Of its applicability to the higher, not to say the highest, branches of intellectual instruction, the fullest persuasion is, over and over again, expressed in the works of its illustrious inventor, whose anticipations have, in every point, received such ample and undisputed confirmation from experience.

In common with so many others, the proposed conductors, or superintendents, undermentioned, had for a long time been entertaining the wish, not unaccompanied with the expectation, of seeing, in some mode or other, and by some means or other, so desirable an extension carried into effect; meaning, of course, on the ordinary *terms*, and by *professional* hands;

* From a Greek word signifying *useful learning*: the English word found in an English book of the 17th century. The Greek word χρησομαθης is employed by Cicero.

and *that* too, in respect of the *extent* of the field of instruction, upon such a scale as would be suited to the efficiency of the *novum organum*, now placed within the reach of human industry, and the amplitude of the prospect opened by it to the public view.

Upon a more attentive consideration it appeared, however, to several of them, that, for a *first* experiment of this kind, more requisites were necessary, than could naturally be looked for in any single hand, or even in any number of hands uniting together upon any such ordinary ground: and of this conception the result has been an Association entered into by them for this purpose.

II. *Proposed Conductors,—Who.*

Not to speak of probity and pecuniary responsibility, qualities, of which, though both are so indisputably requisite, yet neither can, in such a case as the present, be spoken of as appropriate—a commanding acquaintance with the whole field of that intellectual instruction, the communication of which is the object of this design—a detailed acquaintance with the several distinguishable component elements and sources of public welfare; (the great and universal end to which all *art*, all *science*, all *language*, is, or ought to be directed;) husbandry, manufactures, trades, money, and in particular with the practical details of trade as carried on in that vast metropolis, from which almost exclusively the destined partakers of the proposed benefit can, for some time, be expected;—*all* these various endowments will at first view present themselves, if not as being in every instance indispensably necessary, at any rate as being eminently desirable. All these endowments, in common with the whole public in the most essential instances, and with an ample portion of it in every other instance, the Members of the Association, the proposed Conductors, had the satisfaction of seeing united in

their whole body:—a satisfaction in which, upon enquiry, or without need of enquiry, an ample share will be received by every individual, who, either in the character of proposed patron of the institution, or parent, or guardian of a child to which the benefit of it is proposed, feels any interest in the design.

The person by whom, without the communicated desire of any one of them, and without the privity of any more than one, this paper has been drawn up and sent to the press, has not, nor can have, the honour of being of the number: he may *therefore*, with the less difficulty and reserve, speak of the title, which on this occasion, and to this purpose they will, every one of them, be found to possess, to the requisite public confidence. Their names will be found in a separate paper hereunto annexed.

III. *Primary requisite, a SCHOOL HOUSE: proposed to be built by Subscription.*

In the nature of the case, the first requisite, on which every thing depends, and in the non-existence of which the chief cause of retardation may be found, is a *School-House:* an appropriate School-House, and *that*, in its dimensions, of an amplitude, suited to that magnitude of scale, on which, not only in respect to *cheapness* and *extent*, but in respect of *efficiency*, the *New Instruction System* so essentially depends.

For the attainment of this requisite, a pecuniary *advance*, and *that* to no inconsiderable amount, was obviously necessary: and for this purpose the proposed conductors all presently agreed to become contributors, in such proportions as should be suited to their respective circumstances and convenience at the time of the commencement of the expense: an agreement which was the more readily entered into, by reason of the assurance they all saw reason to entertain, that whatever should be there bestowed would be no more than *an advance*, of which the reimbursement (which was all that by

any of them has ever been looked for, or will be accepted) might not unreasonably be depended upon, on condition of a few years patience.

It is for the completion of the sum requisite for this purpose that the present *proposal* is put into circulation.

IV. *Proposed Field and Plan of Instruction.*

This proposal has for its accompaniment a collection of papers, drawn up by a friend to the proposed Institution, who, though declining to take any part in the management, has in this manner, as well as by his contributions, manifested his desire to see it carried into effect.

These papers have for their general *title, Chrestomathiá:* and for their *design*, the giving a view of the field and means of Instruction, proposed for the proposed Chrestomathic Day-School.

Partly for the sake of compression, partly for the accommodation of any persons, who may be disposed to look into it with attention, the main body of this Sketch is comprized in two Synoptic Tables, digested into the form of *Text* and *Notes*.

In Table I. the matter is arranged under the following general heads: viz. ADVANTAGES, from *Learning* as such, as well as from Learning in the *particular shapes* here in question—STAGES of INSTRUCTION—GROUNDS of PRIORITY, in relation to the branches herein included, and GROUNDS of OMISSION in relation to Branches *not* included.

In Table II, under the two following;—viz.

I. PRINCIPLES constitutive of the *New Instruction System*, considered as applicable to the several ulterior Branches of *Art* and *Science*-Learning (*Language-learning* included.)

II. EXERCISES, by the performance of which, such learning is obtained or obtainable. In the instance of these *prin-*

ciples, by means of the *simultaneousness* of the view, which, as above, is given of them, the connexions and dependencies, of the several parts of the admirable whole, will, it is hoped, be the more readily observed, and correctly and completely comprehended.

On these considerations, in the instance of this last mentioned Table, (this happening to be the first of the two that was completed), the whole matter, *Notes* as well as *Text*—was, in the first instance, brought together, and compressed into one side of a single sheet: and in this form copies, to a considerable number, have been printed off. Observations however having been made—that, while by the unavoidable closeness, added to the smallness, of the type, it could not but have been rendered afflictive to many an eye, it was by its still unavoidable bulk rendered in no inconsiderable degree unwieldy and formidable,—another impression has since been printed off, in which the *Text* alone is in the *Tabular*-form; the accompanying *Notes* being in the ordinary *Book*-form:—and in this manner alone, viz. *Text* in the *Tabular*, *Notes* in the *Book* form, has Table I. been printed.

To the principal matter, as contained in these two Tables, other papers are added in the form of an *Appendix*. The contents have for their object—partly a statement of some of the promises of ulterior success which are already known to have been furnished by experience,—partly a view of some ideas, which to the hope of *utility*, are supposed to add in some degree the character of *novelty*, and which, such as they are, the present design has been the means of calling forth.

V. *Site for School House secured.*

A requisite, the procurement of which might naturally have presented still greater difficulty, than any that is expected to attach upon the raising of the comparatively moderate sum necessary for the expense, was a *spot of ground*, sufficiently

adapted, in respect of *situation* as well as *extent*, to the purpose of serving as a site for the erection. But this difficulty they have the satisfaction of declaring to be already removed.

VI. *Females proposed to be received—Why?*

Their wish being as above, to give to so great a benefit, and *that* in every direction, the utmost extension in their power, the *female* sex could not fail of being comprehended in their views.

In the whole of the proposed field of instruction, as marked out in the above mentioned paper, scarcely will there be found a spot, which in itself, custom apart, will not be, in respect of the information presented by it, alike useful to both sexes: some parts, (and more especially those which concern *Domestic Economy*, and the care of health, as applied to the more delicate sex, and to both sexes, at the time of life during which they are almost exclusively subject to its care), will even be found *more* useful to females than to males. By an experienced as well as eminently intelligent disciple of Dr. Bell's,* it is mentioned as a "well-known fact, *that girls are more docile and attentive than boys*;" and that accordingly, in that part of their school-time, which remains after subtraction of that which is applied to occupations appropriated to their sex, the degree of proficiency which, at the end of the year, they have attained, is not inferior to that which, in the whole of that same school-time, has, within that same period, been attained by the boys.

In the case of the *middling* classes, to whatsoever other branches of instruction the labour of female children be applied, *needle-work* will certainly not be regarded as one that can be omitted; and though, for the practice of this art,

* Village School Improved, by J. Poole, M. A. 1813. p. 16.

there would remain several hours of the four-and-twenty, yet what may naturally be expected is, a general wish to see some portion of the *school-time* allotted to such works.

Dancing, Music.—By these fascinating words are presented two accomplishments, the possession of which will, by all that belong to the *higher* classes, be regarded as indispensable; and, by many of those that belong to the middling, as being, if not indispensable, at the least desirable. For neither of these, it is evident, can any place be found in the proposed school. For uniting its benefits with those accomplishments, there remain therefore but two expedients; viz. the deferring of the accomplishments, either to a later *hour*, or a later *age*.

VII. *Number proposed to be built for.*

Under the *National Institution*, the number built for in the *Westminster Free School* is observed to be 1,000; viz. for males 600, for females 400. The same total, viz. a thousand, is, in case of a sufficiency of funds, the number here proposed to build for: in case of a deficiency, the number built for must of course be proportionably reduced.

As to expense, £5,000, they observe to be stated as the expense of *that* building; furniture, as well as lodging, for Master and for Mistress included. That same sum, it is presumed may be made to serve equally well for the here proposed school-house.

According to the indications afforded by experience, the above number of 600 is understood to be generally regarded as the greatest number that, in one and the same *school-room*, can be taught under the constant inspection of one and the same Master. But, on the plan, on which it is here proposed to build, it will be evident, that,—whatsoever be the dimensions of the apartment, in which that number can be sufficiently inspected by one person,—several such apartments, containing, each of them, as much room as in *that* case, will in *this*

case be inspectable by one and the same person, and *that* in a manner still more perfect than in that *other* case.

Moreover, in this same place, though no part of the room allotted to *females*, will, unless at some special *time*, or by specially recorded order, and for special reason, be open to the view of any person stationed in the part allotted to *males*; yet, by means of a slight alteration, any *redundancy* in the quantity of room allotted to either sex may be applied to the supply of any *deficiency* which, in consequence of an increase beyond the calculated demand, may be found to have place in the quantity originally provided for the other.

Considering that, in the case of the Westminster Free School, a *thousand* was, in the judgment of the National Society, as large a number as it was advisable to build for: and *this*, although the class of scholars in view composed so much larger a portion of the juvenile population than that from which any scholars could be looked for to the proposed Day-School, a conclusion which may be liable to be drawn, is—that, in and for the here proposed School, no number so large, or nearly so large as the above, can reasonably be expected.

But, in the case of that *Free School*, free as it was and is, limits were set to the probable number of scholars, by several circumstances, none of which will, in the present instance, be found to have place. On the part of the parents,—insensibility to the advantages of intellectual instruction,—inattention to the future and lasting welfare of their children,—inability to spare the time necessary to the conducting of the children, for the first part of the time, to and from the school, especially in the case of those whose abodes are in a considerable degree *distant* from it.

In the present instance, to obviate, as far as may be, the latter difficulty, an expedient, which the proposed Conductors have in view,—is to comprise in *one* sitting the whole quantity

of the school time; and by that means reduce to its *minimum* the time and attendance, consumed in the passage between school and home. In the Westminster Free School, the total quantity of school time—in the season of longest light, *six* hours,—in the season of shortest light, *five*,—is divided into *two* portions, with an interval of one hour between the two. In private schools, however, instances are not wanting, in which, without any interval, the children are kept under instruction for so long a time as six hours. To so great a length, the proposed Conductors are somewhat afraid to stretch it: but to such a length as *five* hours, they expect not to find any conclusive objection.

One circumstance they look to, as a source, though not of *immediate*, yet in case of success, of *eventual*, increase, to the population of the proposed school. Against any such undertaking as that of a *Boarding School*, to be carried on, or commenced, under *their own* management or even superintendance, their determination is decided. But, in case of success, a result, which they cannot regard as by any means an improbable one, is—that parents, situated at too great a distance to admit of their sending their children from their own residences, may, for the purpose of taking benefit of the instruction there and there only to be obtained, find, for their children, in the residence of some relative or other particular friend, or even of some person, who may be disposed to afford the accommodation on the ordinary commercial terms, a residence sufficiently near to the School-House to admit of their receiving the instruction which it affords. On this plan it is, that, to the great public schools, scholars are sent, from the remotest parts of the three kingdoms: and, should it appear that, in the proposed new school, useful instruction in much greater variety as well as quantity, is to be had, than in any of those old established ones, and that too in much less *time*, and by *every* scholar without exception, in-

stead of no more than a portion more or less considerable of the whole number, they see not why, in the present instance, an equal, if not superior afflux, may not sooner or later, be expected.

A circle of about *two* miles radius, having the site of the school for its centre, is the space, from the whole of which, on condition of keeping the length of school time undivided, they regard themselves as entitled to look for scholars; and *that* without any change made for this purpose in their place of residence.

VIII. *Ages, looked for, at Entrance and Departure.*

Fourteen is the age at or before which they hope to see their intended course completed, by the scholars in general, in all its branches: and this too, upon the supposition that *seven*, and no earlier, is the earliest age at which children will be sent to take the benefit of it: *fourteen*, that being the age at which it is common for *apprenticeships* to commence: for, though no such views are entertained, as that of confining the benefit to such children as their parents may have destined to apprenticeships, yet it would be altogether repugnant to their wishes, if any child so destined should, on any account, find himself excluded from it.

The *seven years*, reckoning from *seven* to *fourteen*, is the length of time, within which, as above, they expect to see the aggregate course completed: and, as a ground for that expectation, one of their endeavours has been, to collect, from the various education and intellectual instruction establishments, in which, instruction on any of the proposed subjects of the proposed scheme of instruction is administered, Public Schools, Universities, Hospitals, Public Institution-rooms, and Private Lecture-rooms not excluded—an account of the number of *hours* actually occupied in each: and this, to the end that the sum of the times so expended in all of them

together, may be compared with the sum of the times, capable of being allotted to the same subjects in the proposed school: and though, of the information desired on this ground, the whole has not as yet been obtained, yet enough *has* been obtained, to enable them, and with the requisite degree of confidence, considering the experienced force of the new instrument with which they will have to work, to speak of the above proposed length of time, as being fully sufficient, viz. for the aggregate of all the courses, according to the plan exhibited in the accompanying sketch: matters being, at the same time, as far as may be, so arranged, that, at several different stages, the scholar may take his departure, without leaving his instruction imperfect, in relation to any subject, in which he has begun to receive it.

When *seven years* was thus looked to as the probable duration of the aggregate course, the occupation had, however, for its basis, the supposition that, at *that* age, in the situations in life in question, scholars might in general be found already in a sufficient degree instructed in those branches, to which, in the free schools at present established, the *New Instruction* system is applied. But, consistently with that principle of universal comprehension, which they could not but adopt, no child whose parents, being desirous of obtaining for it a share in the benefit, were able and willing to pay for it at the necessary price, could, by the conditions of the undertaking, be excluded.

By this consideration it is, that they have been led to the persuasion which they entertain, of the necessity of comprising in their plan those arts of primary necessity and continual and universal application, (viz. reading and writing, and common arithmetic), which are comprehended in the *New Instruction* system, in so far as already brought into practice. To this determination, an ample confirmation has been observed to be afforded by the observation made and repeatedly

brought to view by Dr. Bell himself, (and which is no more than upon an attentive consideration of the case, might from the first have been previously expected,) viz. that in any of those arts, an imperfect degree of proficiency, obtained by instruction, administered in the ordinary mode, operates rather as an obstacle, than as a help to, an useful foundation, for instruction administered in this, incomparably more advantageous mode: *learning*, in the improved mode, having to an undefinable degree, for its necessary preliminary, the *unlearning* what has been learnt in the other ordinary, and ordinarily imperfect, mode.

Of one rule the necessity is, by the bare mention of it, rendered indisputable, and *that* is, not to admit or continue to receive any child who, whether on account of immaturity of age, or on any other, is so circumstanced as to require, in the school-room, more care and attendance than the quantity of each, which is at the command of the Establishment, can supply. As on so many other occasions, so on this, a rule which, while it thus bears on the face of it its own reason, and thereby its own explanation, is applicable with equal propriety to every individual case included in it, they cannot but regard as preferable to any rule, in which, by means of fixt and inflexible quantities, invariable provision is, in the *Procrustes* style, made for indefinitely varied exigencies.

In the *Barrington School* at *Durham*, at an age as early as *three* years, the *New Instruction System*, as is to be seen in the instructive and interesting account for which the public is indebted to *Sir Thomas Bernard*, has been found applicable with advantage:* and if, at an age still earlier, any child should be offered to the reading and writing form of the Chrestomathic School, there seems no reason why it should

* The Barrington School, London, 1813, p. 99.

be rejected, on any other ground than that of an exclusion put upon it by the irrational rule just mentioned.

IX. *This but an Experiment—expected Sources of Continuance and Extension.*

The proposed undertaking being but an experiment, the period which the proposed Conductors look to, as that of the *completion* of the experiment, is the time at which the whole of the proposed field of instruction, as marked out in the *Chrestomathia*, shall have been travelled over, by the whole number of such of the scholars, as have gone through the aggregate course. At that time, if not earlier, the expectation of the proposed conductors is—that such of them, as are then alive, will have the satisfaction of beholding a number of fit persons willing, and in every respect well qualified, each of them by himself, to take the whole of the business out of their hands. Well may it be—and this was the very consideration by which the association was produced—well may it be, that, at present, any such undertaking is too great,—considerably too great—for any single individual. Accordingly, the engaging in no inconsiderable number, as well as variety, a set of Masters, for the administering of the instruction in the several branches, is among the measures, the necessity of which is in full view.

But, at the period here in question, scholars, by dozens and by scores, may not unreasonably be expected to have *learnt*, in the Chrestomathic School, all the things whatsoever that will have there been *taught*. Viewing the matter at large, whatsoever it be, that a large number of persons have themselves *learnt*, supposing it well learnt, some proportion or other of the number will, by that same time, be not altogether unqualified to *teach*. But, at the period in question, under the New Instruction System, the scholars—no inconsiderable proportion of them—not only may reasonably be expected to

be qualified to teach what they have learnt; but, during a length of time, more or less considerable, antecedent to that of their departure from the school, will *actually* have been employed in this same all-comprehensive work. At this time, if, in point of legal maturity of age, as well as in all other points, any one of them should be found competent to such an undertaking, so much the better. But even if, in respect of those requisites, the school should not happen to afford any individual who was, at that time, competent; yet, if so it were, that in point of intellectual maturity, as well as appropriate proficiency, any *one* such scholar should be found sufficient, the temporary legal deficiency might, as under the care of the already established Societies, find an adequate supply in the assistance of some trust-worthy friend.

X. *Terms of Contribution, &c.*

For the erection, fitting-up, and furnishing of the School-House, with the necessary out-buildings and other out-works, the following are the terms and conditions, on which the contributions of well-wishers are solicited.—

1. Contributions to be in shares of £10. each.

2. By any person any number of such shares may be subscribed for: several such shares are subscribed for by each of the above proposed Conductors.

3. For every such share, interest, at the rate of 5 per cent. shall eventually be allowed, as per Article 13.

4. Of the money, received as per Article 7, after defraying charges, as per Article 7, together with House expenses, and pay to Master, Mistress, and paid Teachers, the whole surplus, except such as shall be deemed necessary to be kept in hand for the contingencies of the year, shall, in the first month of every year, be invested in Government Securities, to serve as a sinking fund for the reimbursing to Subscribers, in equal proportions, the money respectively advanced by them: such

reimbursements to be made, each time, by instalments of 10 per cent. so soon as the aggregate of the money so applicable shall have risen to that amount.

5. Any sum, of less amount than a share, will, if offered, be thankfully received: but, whether by itself, or added to the amount of a whole share, on no such additional sum will it be understood to be expected, that *interest*, or unless required at the time of the advance made, *reimbursement money* shall be paid.

6. Upon the amount of their respective contributions, the proposed Conductors of the Institution reserve to themselves, in the shape of interest and reimbursement money, the same advantages as, and no other than, those, which, as per Articles 3 and 4, are promised to all other Contributors.

7. Of the School money to be required, the exact amount cannot as yet be fixed. Four pounds is at present looked to as a *minimum*, *eight* as a maximum. The amount must, of course, be different, according as, in the terms of the undertaking, the expense of slates, pens, books, ink, paper, maps, charts, and other implements of instruction, together with the *hire* of such as need not, or cannot, be purchased, is or is not included. In general, parents would, it is presumed, be desirous of seeing themselves at a certainty, in regard to this and every other expense.

8. With or without subscribing for shares, another mode in which encouragement may be afforded, is—by an engagement to send to the School, for and during a specified length of time, in the event of its being opened, one or more Scholars. In this way, with or without sending a child of his own, any person of opulence may, by engaging for the child of another, confer at one and the same time, a public and a private benefit, at one and the same expense.

9. To afford to *Contributors*, and eventually to *Parents*

and *Guardians*, the assurance, that the undertaking will not be hastily abandoned,—for the term of the first three years, to be computed from the time when the Parents or Guardians, of any number of scholars not less than 50, shall have signed an engagement to pay, at such rate as shall at that time have been fixed, for and during such time as shall have been fixed, for the schooling of their respective children, the proposed Conductors engage, jointly and severally, to carry on the proposed School, and in case of loss, to charge themselves with such loss.

10. For this purpose, so soon as the School House, with the appurtenances, shall be in readiness for the reception of scholars, notice of such readiness will be given by advertisements in the London daily papers. A space will be provided, in which, without interruption to the business, subscribers and parents of scholars, being recognized as such by recollection of their persons, or by transferable tickets, which will be given for that purpose, will have a perfect view of the whole business of the School as it is going on. If, from any persons at large, any admission-money be accepted, the amount will be no more than may be judged necessary to keep out noisomeness and mischievous wantonness; and will be applied to the use of the Institution, as above, Article 4.

11. Of all monies received, and the disposition made of them, accounts will be published yearly, or oftener, and at any rate within the first week of each year, in some one or more of the London daily papers.

No. II.

Fatal Effects of Ennui—the Disease of an unfurnished Mind —illustrated by an example.— Account of John Beardmore, Esq.—From the Obituary of the Monthly Magazine, for April 1, 1814, *p.* 270.

After having passed his grand climacteric with less visitation from indisposition of mind or body than happens to mankind in general, at his house in Owen's-row, Islington, *John Beardmore, Esq.* formerly of the great porter-brewing firm of Calvert and Co. in Red Cross-street, London. He was born in dependent circumstances, and of humble parentage, in the country. The theatre of life was his school and university; and, in it, he passed through all his degrees with increasing honours. For many years after his residence in London, he acted as a clerk in the brewery in which he finally became a partner. When it was deemed proper to transfer the concern from Red Cross-street, and to consolidate it with that in Champion-lane, Upper Thames-street, Mr. B. withdrew himself entirely from business, and retired to Islington. Mr. B. possessed a memory richly stored with pleasant anecdotes, sprightly remarks, and useful information on a vast variety of topics, derived not from *books*, but from *living studies*. From the hour in which he quitted business, he grew insensibly more and more the victim of listlessness and *ennui*. With high animal spirits—with a mind still active, and a body still robust—with confirmed health, independent property, an amiable wife, numerous friends, a plentiful table, and a social neighbourhood, Mr. B. was no longer '*at home*,' as it were, in his own house. The main spring of action was now

stopped. In all his pleasures, in all his engagements, for the day, for the week, or for the month, he was conscious of a *vacuum*. Want of customary application brought on relaxation of activity; want of exercise, languor of body, and depression of spirits; a train of evils ensued, comprising loss of appetite, nervous affections, debility, mental and corporeal—decay, pain, and death.

No. III.

Successful Application of the new System to Language-learning, in the case of the Great School, called the High School, Edinburgh: as reported in a Letter to Mr. Fox, from James Pillans, Esq. Rector of that School. From the Report of the British and Foreign School Society, Anno* 1814, *p.* 57.

"You will not expect that I should detail the difficulties I encountered in establishing and applying the Monitorial System to the business of my class, nor the steps by which I have been rising, up to the present moment, from one degree of efficiency to another. To do so would extend my letter to an immoderate length; and though it might be interesting, and not unimproving to a person engaged in the same

* In this School the number of the scholars has usually been between 500 and 600. The School is divided into five classes: each class occupies a separate room. The head class, which is the most numerous, is under the immediate charge of the Head Master, styled *Rector*. To each of the others there is a separate *Master*, who is independent, or nearly so, of the *Rector*.

From one of these *Masters* an account not less encouraging in relation to *his* class, will form the matter of the next article.

occupation, it would be a fitter subject for *vivâ voce* communication with him. Since I entered on my office, scarce a week has passed without suggesting some improvement in my arrangements, all tending to one point, viz. to stimulate and employ to purpose the various faculties of 200 boys, differing widely both in acquirement and capacity; to insure attention, by excitements at once strong and honourable; and to exclude that languor and listlessness, arising partly from want of motive, and partly from the physical misery of being so long in a sitting posture, which most of us may remember to have been the great sources of the unhappiness we experienced at school.

"The branches of knowledge taught in my Class, the boys of which are in general somewhere between twelve and fourteen years old, are Latin, Greek, and Ancient mixed with a little Modern Geography. The Greek and Geography are happy innovations of my predecessor; for the School, by its foundation, is entirely for Latin, and Dr. Adam's introduction of elementary Greek in 1772 was violently opposed by no less a man than Dr. Robertson the historian. I mention this circumstance, because it will account for the unreasonably small proportion of time given to these two important objects.

In the *Latin* Class, which meets at nine every morning, consisting of very nearly two hundred boys, the general business of the day (subject to variation, according to the period of the season, and progress of the pupils), is as follows: A portion of a Latin poet, from thirty-five to forty-five lines of Virgil, Horace, &c. and a nearly equal portion of Livy, Cicero, or Sallust, are to be parsed and translated: a portion of Dr. Adam's Grammar, alternating daily with his Antiquities, is examined upon: these lessons have been all prescribed; that is, the last word mentioned, but no assistance given, the day before. The order of business is this: immediately after prayers at nine, the whole class forms into twenty divisions, under

their respective Monitors, in the Great Hall, and the Cicero and Horace lessons are construed by the nine boys of each division; the duty of the Monitor being, 1. To take care that every boy shall construe a portion of the new lesson; 2. To see that his division understand the syntax and construction of the passage; 3. To take care that the right meaning be always given to the passage in all its parts; and, 4. To mark on a slip of paper the names of the boys who fail in saying. The Grammar lesson is also said to the Monitors. The boys of each division, on the other hand, are instructed to note any false interpretation which the Monitor may allow to pass, and reserve it for an *appeal* afterwards. When this construing and saying have been got through, the signal for removing into the Class-room being given, the Divisions, which have hitherto been arranged in the recesses of the windows of a large hall, move in regular and rapid order up stairs, and take their seats in the general Class, where, whatever is said, is addressed to all the boys. I then proceed to ask if there be any appeals, *i. e.* if there be any boys who think they can prove that the Monitor has allowed an erroneous translation to pass uncorrected in the Division. From four to a dozen boys generally rise in succession; and if they make good their point, they take place, each in his division, of those who have not observed the blunder, and the Monitor himself loses a place. This system binds both monitor and pupil to careful preparation at home; the former, from the fear of detection and exposure by a boy far below him in the class; the latter, both by the infallible certainty of his being called on to say, and reported if he fail; and by the honourable desire of rising in the class, and proving that he knew the lesson better than the Monitor. Further advantage of the liberty of appeal is, that it generally brings forward into discussion the difficult passages (for it is these of course that are appealed upon); and they being settled beforehand, a more perfect understanding of the lesson is secured, and the

necessity of saying it over very frequently is avoided. Sometimes I vary this mode, by making the Monitors themselves, *i. e.* the twenty highest boys, construe one or both lessons, each to his own Division, who are all on the alert to detect a blunder, with a view of making an appeal. Whether the Monitor or Division is to construe, is always a secret till the moment before they begin, when I give out from the pulpit the order of business. After the appeals are concluded, the lessons are construed to me by boys whom I call at random, generally by some of those who have failed below stairs. These I know from the bills or slips of paper, which, by this time, are collected from each Monitor, strung on a wire, and subjected to my inspection. In this translation, questions are put by the Master on points of Geography, History, Antiquities, derivations of words, and niceties of construction and expression; and a freer and more elegant version is required. Every opportunity is also taken, suggested by the classical passages, to give useful information, and to insinuate moral and religious instruction. This, with the examination on Adam's Antiquities, which I always reserve for the general business, occupies the remaining time till eleven, when there is an interval of an hour, and is resumed from twelve till a quarter or twenty minutes past one, when the Divisions form to construe the lessons again,—with this difference, that, instead of a literal, a free translation is expected; and all the information and illustrations which have been given in the course of the day are expected now to be forthcoming at the question of the Monitor, and the places depend upon their aptitude in answering. The *written exercises*, of which there are generally two per week, are of various kinds, chiefly translations from Latin into English, and from English into Latin, which are also examined and corrected by the Monitor, who makes his remarks, and adds his initials,

that he may be responsible. The best and worst are shown up, and places determined accordingly. The exercises for the higher parts of the Class are Latin verses, occasionally English verses, Analyses or Abridgements of what authors they have read in the class, in English and in Latin, &c. and these are shown up to the Master directly, and corrected by him. Select passages of the classics are said by heart on Saturdays, to the Monitors in the first instance, that every boy may be called on, and they report the failures. In the business of the Division the Monitor has the power of putting a boy up or down, according to the figure he makes, always subject to an appeal from his decision to the Master, if the boy thinks himself aggrieved.

" The Greek class, according to the arrangement I found in the School, met only three hours a week. I have lately contrived to assemble it an hour every day, except Saturday. The business here is more elementary, consisting of accurate saying by heart of a portion of Greek Grammar, and minute parsing of a short lesson in Dalzel's Analecta Minora. The more advanced part of the Class read Homer and Xenophon. In order to remedy the inconvenience of having so short a time for Greek, it is proposed as a voluntary exercise to the higher boys, to read and show up every second Monday what are called Private Studies; that is, if a boy, after preparing all the lessons thoroughly, finds he has still some leisure time, he employs it in reading Homer without a translation, making out what he can; and what he cannot, marking as difficulties to be resolved. On the day appointed he mentions the number of lines he is ready to be examined on, and states his difficulties for solution, which is given either by the Master, or by some of his schoolfellows who have conquered them. In this way, and with no other stimulus but having the number of lines read by each publicly mentioned,

and obtaining an hour's play, there are boys now in the Class who are in the habit of showing up from nine hundred to twelve hundred lines within the fortnight.

" The Greek class consists of about one hundred and forty-five, and the lessons are said here too by Divisions. The Greek Monitors generally remain for 20 minutes at 11; and it being then ascertained that they are masters of the lesson, they hear and report on their Divisions from 2 till half after 2, when the lessons are heard up stairs, and the Monitors dismissed sometimes a little before 3 as a reward.

" The *Geography* class meets on Tuesdays and Thursdays at 2 o'clock. The course of instruction in this branch is, 1st. to give some illustrations of the general facts with regard to the Solar System, then to go over pretty rapidly the geography of the four quarters, taking merely the outlines; and, lastly, to descend to minute and particular descriptions of the countries bordering on the Mediterranean, from Gibraltar, by France, Italy, Greece, shores of the Baltic, Asia Minor, &c. back to the Straits: then the British Islands. Ancient and Modern Geography are united. A sketch or outline of each country is drawn by the Master on a black board with white chalk; the mountains are represented in green, and the rivers in blue. In this state the board is first presented to the pupils, and the Master, with a rod, explains the physical features of the country, points out and names the leading ranges of mountains, and the rivers that fall from them. The board as yet presenting so little detail, the eye, and the mind through the eye, readily takes in and retains the information. At this stage also, the length, breadth, longitude, latitude, and boundaries are fixed. The next lesson presents the towns, (drawn thus ⌗ in pink chalk) which are to be found on the rivers already learned, descending from the source to the mouth. These towns are demonstrated by the Master in the same way, care being taken to mention at the time some

striking facts respecting the situation, inhabitants, history, or neighbourhood of each, which may be associated with its name and position on the board. Having thus made out a sort of skeleton or frame-work of the country, by presenting, in striking relief, without those details which confound the eye in maps, the great *physical* features, the next object is to mark out in dotted lines the *artificial* divisions: and when these are well fixed, the remaining towns of importance, whose position is not indicated by rivers, are referred to the province or shire, and associated again with those already known. The situations of great battles are pointed out by a cross in red chalk. The object being to make a strong impression on the eye, and to set the imagination and conception to work, the chalks being of different colours is a circumstance not to be despised. When the board-draught is thus completed, maps are directed to be so constructed as to be as nearly as possible copies of it; that is, all the positions, &c. accurately laid down, but no names given. The drawer of the map must be quite *au fait* in naming every place in his own sketch; and if it be thought deserving of that honour, it is mounted on thick pasteboard, and hung up in view of his schoolfellows. He is employed too, as Monitor, to teach the geography of his own map to other boys who have either done worse maps, or none at all; and thus, in many ways, the information he has got is rivetted in his memory. The book used for the Geography Class is Dr. Adam's Summary: but as, from its size and multifarious contents, it is better adapted for reference than committing to memory, I have printed for the use of the Class a few pages of Outlines, containing a mere list of names, arranged on the plan I have explained; and this being in their hands serves to recall the information conveyed."

No. IV.

Successful Application of the New System of Instruction to Language-learning, in the case of one of the Classes of the High School, Edinburgh, as reported in a letter from Mr. James Gray, Master of the Class, to Edward Wakefield, Esq. 28*th Dec.* 1813.

THE following details will, I fear, be found uninteresting; but their results are so important, that I trust you will excuse a little dulness, while I endeavour to develope the plans of tuition lately adopted by some of the Masters of the High School, Edinburgh. It will be unnecessary to state, that the practices alluded to are founded on the system of Mr. Lancaster, modelled according to the circumstances of our Seminary. The essential part of that gentleman's discovery is, I apprehend, that by which the more advanced or cleverer boys are employed in teaching or in assisting in their tasks their inferiors in years or in knowledge; and *this principle is acted upon here in its fullest extent.* Many misconceptions have gone abroad in regard to this celebrated plan, which it is of vital interest to have removed. 1. The first and most pernicious of these is, that it is only applicable where great numbers of the lower classes of children are to be taught by the same master, gratis, or at a low rate. 2. Another is, that where schools have been previously established, either by law, as the parochial schools of Scotland, or on a foundation, changes are not only unnecessary, but might be dangerous. It is besides unfortunate, that many school-masters seem to consider the Lancastrian system as an innovation, which they ought to regard with a jealous eye. Till these prejudices are eradicated from the minds of parents and teachers, the advan-

tages derived from the plan will be partial and inconsiderable. In my opinion, many more beneficial consequences will result to the interests of education, from introducing it into the schools already existing, than from establishing new ones; for it is not to be dissembled, that evils have long existed, that admit of no other cure. I shall take as short a view as possible of the practices in common use, contrasting them with the new. I ground my remarks on a full and impartial experiment; and in making them to you, I have no other view but the interests of the youth of my country. For many years past, these have been the subject of my nightly dreams and my daily meditations; to them I have more than once sacrificed my health, and even risked my life; and nothing shall deter me from speaking the truth.

Suppose a class to consist of a *hundred* boys, which I shall take as the average number, though *in our school it is under the truth.* In the old way, one boy was called upon to repeat a small portion of the lesson, to whom all the rest were understood to be listening. Thus we proceeded, till every boy in the class, or as many as could be overtaken, were examined: and this plan would have answered well enough, had it been possible to fix the mind of every individual upon the same subject at the same moment; but such is the volatility of the youthful mind, that I have ever found this impracticable. You may confine the body to a seat; you may, perhaps, fix the eye to a book; but you can never be certain that it is not an unconscious gaze; and it is not unlikely, that while the boy ought to be mentally construing his lesson, his imagination is chasing a butterfly, or robbing a bird's nest. On this system I have experienced two unavoidable evils. 1. The one is, that the upper boys, who gain a knowledge of the lesson soon after they enter the school-room, cannot be kept still while the master is employed in teaching the under boys; and as example is contagious, the restlessness soon becomes

universal. 2. The other is, that while the upper boys are construing, the under ones are generally trifling, and when the lesson comes round to them, are totally ignorant of it. They not unfrequently calculate upon the chance of escaping altogether, from the impossibility there is for any one man thoroughly to examine a hundred boys in two hours; for we never continue longer in school at any one time; and next meeting brings a new task. Thus both the upper and the under boys are injured. The one do not gain all the profit which they might from a more judicious management; the other make little or no progress, and, from the habitual neglect of their duty, contract a dislike both to their tasks and their teachers. In many cases it would be well if the evil ended here; for there is reason to fear, that the hours that ought to be employed in the acquisition of useful knowledge, will be spent in habits dangerous to virtue; that indolence will shed its mildews over the blossoms of early talent, which may wither never to bloom again; or that the man will have to struggle hard to supply the deficiencies of the boy. I am far from saying that the evil is universal. According to the present system, many boys spring forward in the pursuit of knowledge, with an alacrity and success that is quite astonishing; but if, of an hundred boys, twenty fail in the object for which they are sent to the school, any scheme that might ensure their success ought to be eagerly embraced. This may be done effectually on the new system, by which I have been enabled so to arrange my class, that every boy is employed every minute of the time he is in school, either in the acquisition or communication of knowledge. The fifteen highest boys are monitors. The first thing to be done after the meeting of the class, is to see that they have their lessons distinctly. When this is ascertained, the whole class goes into divisions. In this way fifteen times as much work can be done in the same space, and, I can say with confidence, fifteen times bet-

ter. From this contrivance, instead of the languor and restlessness that too frequently prevails, all is activity and energy. More noise, indeed, is heard; but the sounds are sweet, for they are the sounds of labour. Every one studies, because, by the exertion of his talents, he finds himself equal to every task; and ignorance is more shameful, where the account is to be rendered to one of his own years, than to a man. It seems, indeed that boys are better qualified to teach boys, than men. They enter more readily into their feelings; they are more sensible of the difficulties which they themselves have just mastered; and will adopt more simple and familiar modes of illustration. Nor have I ever had cause to suspect the diligence or fidelity of a monitor. To attain this station, is an object of raising ambition to the whole class: and where any one has risen to it, he is too much afraid of losing it, to risk the disgrace by his own misconduct. I have never once found it necessary to degrade a monitor for inattention to his division. To this there is a double check. An appeal is open to the division against the monitor, as well as to him against the division; and when every boy has gone over the whole, not a portion of the lesson, I examine a number of them promiscuously, and the lessons are said with so much more promptitude and accuracy than in the old way, that I am frequently enabled to examine as many as if no time had been spent in divisions at all. Thus I have united the advantages of both methods. By this means, every boy in the class, besides the benefit accruing from saying over the whole of every lesson till he has satisfied his *monitor,* is separately examined *by me* two or three times a day. The superiority of this mode over the other is incalculable, as it tends to store the mind with useful knowledge—to infuse a love of learning—to form habits of industry—and to render the whole economy of a school delightful both to scholars and master. Of my present class, that has been conducted on this plan, all have gained a more

extensive knowledge of the Latin language than I have known on any former occasion; and not a single boy has failed. This, till now, I did not think possible. For many years it had been a subject of melancholy reflection to me, why so many boys *failed in* acquiring a competent knowledge of *classical learning*, while they *succeeded in every thing else*. This objection to our classical schools may now be easily obviated. I do not say that every boy will be *equally* successful. Nature has made strong and marked distinctions in the extent of capacity; but I will venture to assert, that every one may be made to turn his talents to the best account. One of the most important of the objects of a good education, is to inspire a literary taste; and I know no way in which this can be done so effectually. What deters many boys from the prosecution of ancient learning is its *difficulty*. By aid of the Lancasterian system, asperities may be smoothed, the boy may be gently led over the threshold of the temple; and when he is once introduced, he cannot fail to be charmed by its beauties. I have never, indeed, known a young man who pursued learning, that did not love it. This bias to literature is of more value than all the knowledge he earns from school. It is the shield of the young mind against the ruinous inroads of vice. In a school so regulated, it is impossible for any boy to spend his time idly. He must exert himself. He readily does what he finds he cannot escape; and what may have been irksome at first, soon becomes pleasant. He is happy, from a consciousness of doing his duty; and habits are formed, that will be useful through life. To the master, the task of superintending such a school is delightful. He is merely the helmsman that steers the bark, under perpetual sunshine, while every man on board is at his duty. Corporal punishments are abolished. This practice is equally degrading to the scholar who suffers, and to the master who inflicts punishment; and I firmly believe has done more mischief to our classical schools

than all other causes whatever. The boy soon considers the man, whom he sees in the daily use of the torture, as a tyrant, and his greatest enemy; and all his ingenuity will be exerted in inventing the means of retaliation. A great objection to this mode of discipline is, that from its very nature the master applies to it with reluctance; and for one fault that is punished, twenty escape. Thus the hope of impunity begets disorder, which, when it comes to a certain height, in its turn brings punishment. On the new method, the boys are kept in constant good humour, and no irritation is ever excited in the mind of the master. There exists between them only a reciprocity of kindness and docility. To animate a whole school with one spirit, to make them advance in the intellectual career with the same march of mind, to stimulate them to exertion by the enlivening power of emulation, to exalt them in their own opinion, has always been my object in the discharge of my public duties; and Mr. Lancaster has put into my hands an instrument, by which I have been enabled to realize my fondest visions in my most sanguine mood. This is a testimony that I think due, and I cannot withhold it.

I have the honour to be,

Dear Sir,

Yours faithfully,

JAMES GRAY.

CHRESTOMATHIA;

PART II.

CONTAINING

APPENDIX, No. V.

BEING

AN ESSAY

ON

Nomenclature and Classification:

INCLUDING

A CRITICAL EXAMINATION

OF THE

ENCYCLOPEDICAL TABLE OF *LORD BACON*,

AS IMPROVED BY *D'ALEMBERT*;

AND

THE FIRST LINES OF *A NEW ONE*,

GROUNDED ON THE APPLICATION OF

THE *LOGICAL* PRINCIPLE

OF

EXHAUSTIVELY BIFURCATE ANALYSIS

TO THE MORAL PRINCIPLE

OF

GENERAL UTILITY.

By JEREMY BENTHAM, Esq.

London:

PRINTED FOR MESSRS. PAYNE AND FOSS, PALL-MALL;

AND

R. HUNTER, SUCCESSOR TO MR. JOHNSON,

ST. PAUL'S CHURCH-YARD.

1817.

J. M'Creery, Printer,
Black-Horse-Court, London.

CORRIGENDA.

☞ *The weakness of the Author's eyes, concurred with the badness of his handwriting, in giving birth to the following long and much regretted list of* CORRIGENDA, *with no part of which, to his knowledge, is the Printer chargeable.*

Page 101, line 26, for *Outology* put *Ontology.*
102, line 20, for *mention* put *notion.*
104, —— 4, for *point* put *part.*
104, note, line 12, for *compound elements of the denomination* put *elements of the compound denomination.*
105, ——, line 13, for *power* put *species.*
105, ——, line 17, for *many worded* put *many-worded.*
105, ——, line 18, for *equipellent* put *equipollent.*
105, note, line 9, for *single-wordiness* put *single-wordedness.*
107, —— 21, for *these* put *those.*
112, line 23, for *Of* put *By.*
113, —— 2, for *matter* put *matters.*
118, —— last, for IV. NOTE put I. NOTE 9.
121, —— 13, for *as* put *we.*
125, —— 2, dele the comma.
128, —— 27, for *this* put *the.*
129, —— 2, for *an* put *no.*
130, —— 12, for *purpose* put *purposes.*
131, —— 5, dele both commas.
132, —— 19, after *on* put *to.*
132, —— 20, for *every* put *any.*
134, —— 8, for *nature* put *natures.*
135, —— 3, for *when* put *alone.*
139, note, for *Portique* put *Poetique.*
144, ——, line 11, for *this* put *their.*
144, ——, line 18, for *faculty* put *faculties.*
145, ——, line 13, for *formed* put *found.*
145, ——, line 22, for *least* put *last.*
145, ——, line 14, for *synthesis* put *analysis.*
145, ——, line 19, for *in* put *on.*
148, ——, line 6, for *test* put *list of faculties.*
148, ——, line 9, after *stand* put a colon.
153, line 27, after *states* dele the comma.
157, —— 6, after *thought* put *have.*
161, —— 1, for *viz.* put *was.*
161, —— 13, for *difference* put *differences.*
162, —— 15, for *receding* put *succeeding.*
166, note, line 1, after *doit* put *suivre.*
167, line 16, after *use* dele *is.*
167, —— 21, for *genius* put *senses.*
168, —— 6, after *necessary* put *and.*
170, —— 5, for *ill—served* put *ill-served.*
171, —— 3, for *these* put *those.*
176, lines 14 and 20, for *Outology* put *ontology.*
176, note, line 1, for *outology* put *ontology.*
177, line 6, after *name* put *ontology.*
177, —— 19, for *compositiness* put *compositeness.*
177, note, lines 3 and 6, for *outology* put *ontology.*
179, lines 8 and 13, for *Outology* put *Ontology.*
179, note, line 1, for *Outology* put *Ontology.*
182, ——, line 22, for *every* put *a.*
182, ——, line 23, for *a sort of uneasiness* put *an inconvenience.*
182, ——, line 24, after *sensible:* put *want of.*
182, ——, line 25, for *avoidance* put *want.*
182, ——, line 26, for *so, more seldom* put *so much more serious.*
182, ——, line 28, after *purpose*—put *viz. designation of the.*
183, line 1, for *Pœcological* put *Poiological.*
183, —— 1, for *Somatic* put *Somatics.*
183, note, line 3, for *Pœcology* put *Poiology.*
184, line 18, for *these* put *those.*

Page 185, line 16, after *figures* put a colon.
186, —— 12, for *Poelogical* put *Poiological*.
186, —— 19, after *into* dele 1.
186, note, line 5, after *negation* dele *absence*.
189, ——, line 13, for *Ænæsthesioscopic* put *Anæsthesioscopic*.
190, line 17, for *Plants, Animals* put *Plant-Animals*.
195, —— 4, after *division* put *viz. Experimental Philosophy*.
196, —— 6, for *accordingly* put *that is to say*.
196, note, line 15, for *flattering* put *fluttering*.
197, line 2, for *Thelomatoscopic* put *Thelematoscopic*.
197, note, line 10, for *Thelomatoscopic* put *Thelematoscopic*.
198, line 3, for *partly in consideration* put *in consideration partly*.
198, —— 13, for *that* put *the*.
198, —— 12, for *though* put *as being*.
198, —— 12, for *that* put *the*.
198, —— the last, for *minutely* put *remotely*.
204, —— 1, for *Thelomatoscopic* put *Thelematoscopic*.
204, note, line 12, dele the two commas.
208, line 7, for *thought—communicating* put *thought-communicating*.
209, —— 20, for *were* put *was*.
211, —— 1, for the semicolon put a comma.
219, —— 4, for *Judication* put *Judicature*, and dele the comma.
219, —— 5, dele the two commas.
219, —— 7, dele the two commas.
223, —— the last, for *Outology* put *Ontology*.
226, note, line 6, for *but* put *than*.
227, ——, line 3, for *mere* put *some*.
228, line 11, dele the comma.
232, —— 7, for *use* put *one*.
233, note, line 1, for *outology* put *ontology*.
246, line 26, for *there* put *thus*.
247, —— 16, for *be* put *by*.
249, —— 8, for *name* put *word*.
249, note, line 9, for *opposition* put *opposites*.
249, ——, line 11, after *extravasation* dele the remainder.
250, line 13, after *For* dele *to Various*, in line 17.
251, note, for Tables IV. and V. put Table IV.
258, line the last, for *Cinesiopfeustic* put *Cinesiopseustic*.
259, note, line 1, for *Acinesiopfeustic* put *Acinesiopseustic*.
263, line 27, for *a desideratum* put *an object*.
272, note, line 14, for *motive* put *notion*.
273, line 10, for *recommending* put *recommencing*.
277, —— 17, for *here* put *have been*.
277, —— 7, for V. put IV.
280, —— 15, for No. IV. put Table IV. No. I.
280, —— 16, for *No. V.* put *Table IV. No. II.*
291, —— the last, for *numbers* put *members*.
293, —— 3, after *to* put *make*.
293, —— 15, for *occasion* put *occasions*.
298, —— 5, after *branches*, put *if*.
301, —— 6, for *division* put *divisions*.
301, —— 13, before *because* put *but*.
308, —— 26, for *formed* put *found*.
309, —— the last, for *Eudæmondes* put *Eudæmonics*.
311, —— 3, for *on* put *in*.
312, —— 10, for *for* put *of*.
316, —— 9, for *creation* put *nature*.
325, —— 11, for *flowers* put *flower*.
326, note, line 5, dele *properly*.
331, line 1, for *damsels* put *the damsel's*.
341, —— 27, before *may* put *which*.
343, note, line 15, for *that* put *the correspondent*.
345, line 21, for *this* put *the*.

CONTENTS

OF

THE SEVERAL SECTIONS OF CHRESTOMATHIA, APPENDIX, No. V., BEING AN ESSAY ON CLASSIFICATION AND NOMENCLATURE.

Page

§ I. PLAN of this Essay— 99

§ II. Purposes to which a denomination given to a branch of Art and Science may be applied—viz. Ordinary and Systematic :—Properties desirable in it with a view to these Purposes— 103

§ III. Imperfections incident to a denomination of this sort: viz. 1. unexpressiveness; 2. misexpressiveness— . 108

§ IV. Inaptness of the appellatives *Natural History*, *Natural Philosophy*, and *Mathematics*— 118

§ V. Cause or origin of this Inaptitude— 126

§ VI. Course to be taken for framing the most perfect and instructive System of Encyclopedical Nomenclature that the Nature of the Case admits of—. . 130

§ VII. D'Alembert's Encyclopedical Map or Tabular Sketch—its imperfections— 136

§ VIII. Specimen of a New Encyclopedical Sketch, with a correspondent Synoptic Table, or Diagram— . 172

§ IX. Explanations relative to the above Sketch and Table— 219

§ X. Uses of a Synoptic Encyclopedical Table or Diagram— 232

§ XI. The Mode of Division should, as far as may be, be exhaustive—why?—. 2

§ XII. Test of All-comprehensiveness in a Division how constructed—Additional Advantages, Distinctness and Instructiveness—Bifurcation, why necessary— 2

§ XIII. Exhaustiveness, as applied to Logical Division—the idea whence taken—Saunderson's Logic—Porphyrian or Ramean Tree—Hermes— 281

§ XIV. Imperfection of the current Conception relatively to Exhaustiveness and Bifurcation; *ex. gr.* I. in Saunderson's Logic— 286

§ XV.—II. in Watts's Logic—. 293

§ XVI.—III. in Reid and Kaimes in Kaimes's History of Man— 295

§ XVII. Process of exhaustive bifurcation—to what length may, and shall, it be carried?— 302

§ XVIII. How to plant a Ramean Encyclopedical Tree on any given part of the field of Art and Science— . 307

§ XIX. Logical mode of division—its origin explained and illustrated— 319

§ XX. Proposed new Names—in what cases desirable—in what likely to be employed?— 343

No. V.

Nomenclature of the main Branches of Art and Science—its Imperfections—with proposed Remedies.—Systematic Table, prefixed by D'Alembert to the French Encyclopedia—its Imperfections—Specimen of a new one.

§ 1. PLAN *of this Essay.*

Deplorable it surely is,—and, to a first view at least, not less extraordinary,—that, for some of the most extensive, and most frequently mentioned, divisions of the field of Art and Science,—even at so advanced a stage, as that to which the human mind has already reached in its travels on that field,—no tolerably expressive denominations should be to be found in the appropriate part of language.

Of language:—meaning of course the one which is here made use of: and which will not be denied to be one of the best cultivated languages which the present time affords: nor, in this particular, will the present state of any other language be found, it is believed, much more favourable.

That this unaptness has really place in the language—that real and practical inconveniences are among the actual results of it—and that, although not perhaps completely susceptible, it is however not altogether unsusceptible, of a remedy:—such are

the positions which it is the object of the following pages to present to view.

But, on the part of the intellectual subject or object in question—viz. the nomenclature of the aggregate body of the arts and sciences, in other words, the system of Encyclopedical nomenclature—this unaptness, in what does it consist? Answer.—In this:—viz. that the nomenclature in question is not, either in the degree in which it is desirable that it should be, or in the degree in which it is capable of being made to be, subservient to those useful *purposes*, to which an instrument of this sort is capable of being rendered subservient.

In respect of any such useful purposes, to what immediate cause will any such failure, on the part of the subject in question, be to be attributed?---*Answer:* To its being deficient, in respect of one or more of those *properties*, which, ere it can be in a compleat degree rendered subservient to those same useful purposes, it is necessary that it should possess.

In so far as, in any degree, it fails of being possessed of those same *properties*, and thereby of being capable of being rendered subservient to those same *purposes*, it will be found chargeable with certain correspondent imperfections, or points of imperfection.

To these several imperfections, if in the correspondent *purposes*, there be any thing capable of entitling them to any such appellation as that of *useful*, it cannot but be desirable, that

correspondent *remedies* should be applied. What then are they respectively—those *purposes*, those *properties*, those *imperfections*,—and, if any such there be, those *remedies?* To find such answers as can be found, for this string of connected questions, is the object of the ensuing pages.

To a disquisition of this sort, inserted in such a work as the present, one very obvious objection presents itself. This is—that it is too abstract and abstruse:—too logical; too metaphysical;—or by whatever other epithet, for the purpose of condemnation, it may happen to it to be designated:—too abstruse for the generality of readers, even of those by whom a course of education of the literary cast, carried on upon any of the customary plans, has been completed.

For this objection, however, an answer,—which (it is hoped) will be found neither in point of fact incorrect, nor in point of argument irrelevant,—is in equal readiness:—at the conclusion of the Chrestomathic course, it will not be too abstruse for the comprehension of a Chrestomathic scholar.

What is there in it that, even to these striplings, should render it too abstruse?—Is it the nature of the subject?—Those parts excepted, which respectively regard general Outology and Pneumatology, —subjects which, for reasons already intimated, it has been found necessary to forbear including in the course,—no one of all the subjects touched upon in it can be pointed out, which will not have been rendered altogether familiar to their view.

Is it then the language, from which, for giving expression to some of the leading ideas, words have been borrowed?—Not to speak of its being the language constantly and universally drawn upon for such purposes; long before the scholars are arrived at this concluding stage, this same language will, in their eyes, have been stripped of all its terrors. Of those appellatives, for which *custom* has concurred with abstract convenience in resorting to a dead and foreign language, the interpretation will here be found all along subjoined: and in this very interpretation may the scholars, long before the conclusion of the course, have found matter for one of their *exercises*. True it is, that, as there has so often been occasion to observe, a *hard word* —a word belonging to a family of words, of which no other member is as yet known, constitutes, in every field over which it hangs, a *dark spot*: a spot, to which no eye, among those in which it excites the mention which that word is employed to express, can turn itself, without giving entrance to sentiments of humiliation and disgust: But, at the time in question, to the eye of a Chrestomathic scholar, in no part of the whole expanse of the field occupied by this sketch, will there be any such thing as a *dark spot*:—to the original darkness, light will, in every instance, have been made to succeed.

Such is the objection, and such the answer. Here, however, if not before, comes another ques-

tion—Of such an exhibition, where is the *use?* But, to a question of this sort, in the present instance at least, the answer will obtain a much better chance for being satisfactory, if postponed till after the thing itself has been brought to view, concerning which it is asked, what is the use of it?

§ II. PURPOSES, *to which a denomination given to a branch of Art and Science may be applied*—viz. *Ordinary* and *Systematic*:—PROPERTIES, desirable in it with a view to these purposes.

Ordinary and *Systematic*—applied to the purpose which, in the giving a denomination to a branch of art and science, has been in view—these adjuncts will, it is supposed, be found tolerably explanatory of themselves. *Ordinary* purpose, the presenting to view the contents of the particular branch which it denominates: *Systematic*, the purpose which is in view, where the denomination in question is one of a number of denominations, brought together in such manner, as to exhibit to view certain *relations*, which the several branches so denominated, and thereby their respective contents, bear to each other. relations, for example, of *agreement* and *diversity*, or relations of *dependence*.

Accordingly, for the designation of the purpose, just described by the name of *the ordinary purpose*, the term *non-systematic* might, with equal propriety, be employed.

From the *purposes* to the accomplishment of which it is directed, follow the *properties* which it is desirable it should possess.

I. On the point of the denomination in question, for both the above-mentioned *purposes*, the two following *properties* may be stated as requisite.

1. Of the contents of the branch of art and science which it denominates, it should present to view—to the view of as many persons as possible—a conception, as *clear*, *correct*, and *complete*, as by, and in the compass of, a single denomination,* can be afforded.

---

* *(Single denomination).* For both these purposes the thing to be wished for is—that, in so far as possible, the denomination should be comprised in the compass of a single word: viz. of course, a *noun substantive:* and this—not merely for shortness, but to avoid the embarrassment which has place, in so far as the appellation is a compound one, composed of two words or more. If, in addition to the noun substantive, there be but one other, that other will be a *noun adjective:* and, by this means, the denomination will be disabled from receiving without inconvenience any other adjunct; the place of the adjunct being already occupied by the adjective, which is one of the compound elements of the denomination thus composed. If it be composed of more than two, the inconvenience will be still greater: for in this case, all the words which enter into the composition of this long-winded substitute to a single substantive, will,—in the texture of any sentence, of which that substantive would have constituted but one component part,—be liable to be confounded with its other component words; in such sort

II. By this means, in relation to every less extensive branch of art and science that can be proposed, it should obviate the question—whether, within the compass of the more extensive, such less extensive branch is or is not included:—it should obviate this question—i. e. in case of doubt, it should furnish the means of removing it, or (what is better) prevent the rise of any such doubts.

III. For the *systematic* purpose, the following is

---

that, in relation to each of them, it will be matter of difficulty—momentary difficulty at any rate—to determine, to which parcel of words it bears grammatical relation: viz. the sentence at large, in which the appellation, had it been a single-worded one, would have officiated in the character of a substantive, or the fragment of a sentence, composed of the words of this compound substitute to a proper substantive.

Such are the circumstances, by which, to all purposes and on all occasions, this simplicity—this single-wordiness—is rendered desirable. But it is only on the occasion of ordinary discourse, that, as will soon be seen, the nature of the case admits of it. In the case of a *systematic table*, for the denomination of each branch, two words at least will be found requisite: one, to mark the *genus* to which the power in question belongs; the other, to give intimation of the *characters*, by which it stands distinguished from the *other species* of that *same genus*.

In what way it is that, as the number of subdivisions increases, the many-worded systematic name grows longer and longer, more and more complicated,—and an equipellent single-worded name more and more difficult to frame,—may be seen in the sample of an *Encyclopædical Diagram* or *Table*, § 8, and the explanation of it which follows, § 9: as likewise in the diagram, called the Porphyrian Tree, hereunto annexed.

an additional property which presents itself as requisite.

It should (i. e. the denomination should) be so constructed—as, in and by its conjunction with other denominations, to display upon occasion,—and *that* in as *clear*, *correct*, and *complete* a manner as possible,—the several *relations*, which it bears to the several other branches of art and science included in the same system:—the *relations*, viz. in respect of *identity* of properties, on the part of the respectively contained particulars, on the one hand, and *diversity* of such properties on the other: that so, in the instance of every branch of art and science, comprehended in the system, it may, to the greatest extent possible, be apparent—in what particulars they respectively agree with, and in what they differ from, each other.*

---

* These relations of identity and diversity of properties—thence of *agreement* and *disagreement*—important as they are, are not the only ones which, in the present instance, are so. In a practical point of view, a set of relations, still more important, are relations of *connexion* or *dependence*: viz. those which have place, in so far as a person by whom this or that art is practised, or science studied, has, in respect thereof, need of an acquaintance, more or less intimate, with this or that other branch of art and science. Instances of this sort of relation may be seen in Table I. But of this sort of relation, between branch and branch, no indication, it may be seen, can in general be afforded by their respective names.

By these means, and by these alone—on these terms, and on these alone—is any conception that has been framed, delivered, received, or entertained of the whole system of arts and sciences—the whole *encyclopædical* system, as it is called—capable of being rendered a clear, correct, and complete one.

Thus, and in this way is shewn—not only *identity*, in so far as identity, but *diversity*, in so far as diversity, has place. In this way, therefore, is performed, in regard to each branch of art and science, *that*, and more than *that*, which is performed by *algebra*, in regard to numbers. The wonders exhibited by that mysterious art—by what means is it that they are wrought? Only by shewing, in each individual instance, the identity which has place, as between the import, conveyed at the outset by those *extraordinary* signs, which, as the instrument of its discoveries it employs, and some one or other of the always manifest imports, conveyed by these *ordinary* signs, of which common arithmetic makes use.

By the mutual lights, which these words are thus made to reflect upon the import of each other—by this means is, and by this means alone can be, conveyed, in relation to the subject which they are employed to bring to view, the *maximum* of information: the greatest quantity of information capable of being brought to view, in and by

the number of words thus employed:* the maximum of information in the minimum of space.

§ III. *Imperfections incident to a denomination of this sort*: *viz.* 1. *unexpressiveness*; 2. *misexpressiveness*.

Correspondent to the *properties*, which it is desirable that a denomination attached to any branch of art and science should possess, are the *imperfections* of which it is susceptible. An imperfection will be imputable to it, in so far as, by failing to possess any one or more of the above-mentioned *properties*, it fails of being applicable with advantage to one or more of the above-mentioned *purposes*.

Imperfections, exhibited by this or that one, of the several denominations, considered by itself—imperfections, exhibited by the whole assemblage of them taken together, considered as a whole—to one or other of these heads will all such imperfections, it is believed, be found referable.

Unexpressiveness and *misexpressiveness*—to one or other of these two heads, it is believed, will be found referable all such imperfections, of

---

* For a more particular account of the uses of a systematic sketch of this sort, and more particularly of a systematic Table, see § 9, 10, 11 and 12.

which any such denomination, taken singly, and considered by itself, will be found susceptible.

The *purposes*, to which it is desirable that a denomination of the sort in question should be capable of being made subservient, have just been brought to view: in so far as it simply fails of being subservient to those purposes, it is *unexpressive—simply* unexpressive.

Of the name, employed for the designation of any branch of art and science, the design and use is—to convey a conception, as correct and complete as by so narrow an instrument can be conveyed, of the *nature*, and, to that end, thereby of the *subject* or *subject-matter*, of that same art and science: and this, in such sort as, when and as often as, in relation to any subject that happens to be proposed, a question shall arise—whether it does or does not belong to the branch in question—to suggest a true and clear answer, either on the affirmative or on the negative side.

If, instead of simply failing to convey any such instructive conception, it does indeed present a conception, but that conception altogether foreign to the subject, and thereby, in so far as it is actually entertained, erroneous and delusive,—then it is, that, instead of being negatively and simply *unexpressive*, it is positively *misexpressive*.

Be the subject in its own nature what it may,—and, on the other hand, the name applied to it,

what any one will,—true it is, that, in the course of time, the name, how completely unexpressive so ever, and even misexpressive, will become expressive.

To this observation no denial, or so much as doubt, can be opposed: and hence it is that, by names in the highest degree, not merely unexpressive but misexpressive, the functions of names are performed,—the purposes which are in view in the use of names to a certain degree answered.

If the misexpressive name in question be a name, by which, when first brought to a man's view, the branch of art and science in question is presented, —much more if it be the only name by which it is ever presented to him,—on this supposition, a question (it must be confessed) altogether natural is—of this supposed original misexpressiveness, what, if any, is the inconvenience? At first mention (continues the argument) true it is, that the conception it presented was, by the supposition, an erroneous one: but, moreover, by another part of the supposition, the conception which has at the long run come to be conveyed by it—conveyed to the very person in question—is a correct one: for, by this name it is, that whatsoever conception he has cause to entertain of the subject, has been conveyed to him: and, in point of fact, by names originally as unexpressive as can easily be imagined, have conceptions no less correct than those

which have been conveyed by the most expressive names, actually, as it will be easy to shew, been conveyed.

Plausible as it is, to the objection opposed by this question, an answer, which it is believed will be found no less plain and clear, than decisive and satisfactory, presents itself.

1. In the first place, by the supposition, a length of time there is, during which, instead of the subject, of which it is desirable that it should convey the conception, the subject which it actually presents, is a different one. So long as this state of things continues, every proposition, in the composition of which the misexpressive name in question has a place, is a self-contradictory one. So long then as this self-contradictoriness, and the confusion, of which it is essentially productive, continues,—so long the inconvenience—nor is it an inconsiderable one—continues to be felt: and it is only after a lapse of time, more or less considerable, that—the new conception having at length in a manner wormed out the original one—the inconvenience ceases to be felt.

2. In the next place, of the sort of name in question, another use, it has been already observed, is—to obviate doubts in relation to the *extent* of the field belonging to the branch of art and science in question: i. e. whether such or such a less extensive district, in whatsoever manner designated, especially if it be a newly discovered, or

newly distinguished, district,—be included in it. In this case, by what rule or mark shall the answer be guided and determined? By the *name*, considered in itself, i. e. considered in its *original* import merely, no true light, but instead of it a false light, is afforded: and, as to the light afforded by mere usage, by the supposition, no light of this sort hath as yet begun to shew itself.

Attached to the use made of misexpressive names, here then are two inconveniences: two distinguishable and undeniable inconveniences, which will be found to have place, in so far as, for the designation of any of the leading branches of art and science, any such improper and unfortunately chosen denominations continue to be employed.

Natural History—*Natural Philosophy*—it will presently be seen, in how flagrant a degree both these denominations—both of them names, by which two *main* branches of art and science are wont to be designated—names in constant and almost universal use—are misexpressive.

Of this imperfection—if any credit be to be given either to experience or to report, the amount of the inconvenience produced is by no means inconsiderable. Great is the length of time, during which it is not without extreme difficulty, nor till after great perplexity, that, in the mind of the beginner, especially if he be a very young begin-

ner, the connexion between the misexpressive general name, and any of the particular matters meant to be designated by it—viz. the subordinate branches included under it, or any of the subjects appertaining respectively to those branches—can be formed.

So likewise as to the other inconveniences: to this likewise the like observation will be found applying with equal truth. This or that less extensive branch—is it to *Natural Philosophy* that it belongs, or to any, and what other more extensive head?—No criterion—no source of guidance—being to be found in the name itself—viz. in its original import,—mere *accident* determines. But in the instance of different persons, the determinations made by *accident* are different. Accordingly, that less extensive branch (*Chemistry* for example,) which in the view and language of some persons, *is* a branch of *Natural Philosophy*, in the view and language of other persons, is *not* a branch of it.

Thus it is that, the boundaries of the main compartments being indistinct, the conception entertained of the whole field of art and science is, in the instance of every mind, more or less inadequate, and either indeterminate or erroneous.

II. Thus much as to the imperfections, incident to the denomination of any branch of art and science, considered by itself. Now as to such imperfections, as do not apply but to the case, where

the whole multitude of them, or a considerable part of that multitude, are collected together, and considered together, in the character of an aggregate.

As often as they are thus considered in conjunction and with reference to one another, the purpose for which they are thus considered, may be termed a scientific, or *Encyclopedical* purpose: and with reference to this extraordinary purpose, all others may be distinguished by the appellation of *ordinary*.

In so far as it is to an *Encyclopedical* purpose that these several objects—the several branches of art and science—are considered, it is for the purpose of obtaining and communicating a view, as clear, correct, and complete as possible, of the whole field of *thought* and *action;* and therein of the whole field of *art* and *science:* and, to this purpose, a view of the several characters, i. e. characteristic circumstances, by which the several component branches of that ideal whole, are on the one hand assimilated to, on the other hand distinguished from, each other.

Learners and teachers (shall we say)—or *Teachers and learners?*—for, on the occasion of the mention now to be made of them, it seems not altogether easy to say, which of these two correspondent classes should be put foremost. Be this as it may, to the situation of both these two correspondent and contrasted classes it is, that, in the framing of a sketch for the purpose in question—in a word for

the framing of *an Encyclopedical sketch*,—the attention of the operator should be directed. As far as any separation can in practice be made, it is by the situation of *learners* that the principal demand for attention is presented: for, all teachers must in the first place have been learners: nor, at any subsequent period can teachers exist without learners; whereas learners *may* exist—and, in so far as individuals are self-taught, *do* exist,—without teachers: and, where both classes have place together, and at the same time remain distinct from one another, the class of *learners* may, and naturally will, be much more *numerous* than the class of *teachers*.

Nor will the class of persons, to whom, in the character of *learners*, an apposite and expressive system of Encyclopedical nomenclature may be of use, be found to be so narrow as might at first sight be imagined. To any one, whose subsequent pursuits were destined to be confined within the limits of ever so narrow a branch of the field, if not the whole, various other parts of such a system will be found, of which a conception more or less detailed will not be found to be altogether useless. Of no one part can a man's conception fail of being the stronger and the clearer, the stronger and clearer his conception is of such or such other parts, which, by means of those properties, whereby they are respectively assimilated to it, and contrasted with it, contribute to reflect light upon it, and by this means place it in the clearer point of view.

To this class (to speak more particularly) will be seen to belong all those persons, by whom the benefit of the proposed system or course of Chrestomathic education will have been partaken of. With few if any exceptions, initiated, as they will be, in every useful branch of art and science,—strange would be the inconsistency, were any such determination taken, as that of forbearing to present to their view those relations of mutual agreement and distinction, by means of which these several branches receive each of them light from, and reflect it upon, every other. For, it is thus, and thus alone, that the mind can be endowed with, and rendered conscious of, that animating vigour, by means of which it feels itself able, with an assurance of success and mastery, to enter and operate with effect, upon any and every part of it, towards which the course of its pursuits may at any time happen to be directed.

But, on the proposed plan, along with the class of *learners* will be augmented the class of *teachers*: and *that* in a much larger proportion, than any which till of late has been in view. For, in the instance of every one of the branches of science thus taught, so it is that, by a very considerable proportion of the class of *learners*, the function of *teachers* will, even before their own term of learning is in respect of that same branch fully expired, be taken in hand and exercised: so that, to the extent of this large portion of the whole number of

learners, the only line of separation between the two classes, is that which will have been drawn by the hand of *Time*.

Of the imperfections, of which a system of nomenclature for the various branches of art and science may be seen to be susceptible, when considered with a view to none but the *ordinary purposes*, as above explained, a conception may presently be formed, and has accordingly been already endeavoured to be conveyed. But, of the imperfections, of which the like system may be seen to be susceptible, when considered with reference to *Encyclopedical purposes*, as above explained,—no conception can be formed, till a conception has been formed of the particular form, which it is necessary a system of this sort should be made to wear, in order to possess—and *that* in the highest possible degree of perfection—those properties, a general intimation of which has just been given: viz. that in which, in relation to each branch, are brought to view the circumstances, in respect of which it *agrees* with, and those in respect of which it *disagrees* with, every other.

Of a system of this sort will here be given a general idea; and that followed by an exemplification, which, though particular, will be a very extensive one,—not embracing merely, but outstretching, the whole of the proposed field of Chrestomathic education. But, in the meantime, that

the nature and existence of the demand, for a reform of some sort, in the nomenclature employed upon the subject, may be the more distinctly perceptible,—an exemplification will be given of its inaptitude, even with reference to the purposes, above distinguished by the name of *ordinary* purposes:—viz. in the instance of those names which are in most frequent use.

§ IV. *Inaptness of the appellatives* Natural History, Natural Philosophy, *and* Mathematics.

1. The branch of art and science for the designation of which the compound appellation *Natural History* is as yet the only one in use, is that which has for its subject *matter* in general: including bodies of all sorts, considered in respect of those modifications, which are found exemplified by it, before any operation has been performed upon it by human *art*, under the direction of human *science*:* or in other words, (if, for familiarity's sake, notwithstanding the unapt floridness of the expression, it should be deemed advisable to employ, as usual, the name of the well-known fictitious personage, *Nature*—in the condition in which it has been found placed by the hands of *Nature*—uncontrouled and unassisted Nature.

Of these bodies—i. e. of *matter*, in all such of

* See Table IV. Note. ¶

its forms with which we have in any way or degree any acquaintance,—the aggregate is composed in the first place of our *Earth*, in the next place of all the other bodies, of which our *World* is composed: of our Earth in the first place, no others being of any importance to us, otherwise than with reference to that, "in which we live and move, and have our being."

Of this earth of our's, the matter is either in the form of matter altogether *lifeless*—matter endowed with life—but *without feeling*, or matter endowed with *life and feeling* both. In and by the several appellatives *Mineralogy*, *Botany*, and *Zoology*, all of them single-worded—all of them in familiar use,—the primary divisions of the branch of art and science here in question are aptly enough expressed. And if,—for the designation of that remaining branch of the art and science in question, which has for its subject the remainder of those modifications of matter with which we have any acquaintance,—the term *Uranology*, as above,* or even the term *Astronomy*, be employed,—in either case, to the nomenclature thus bestowed upon these primary branches of the stock of art and science in question, no considerable objection presents itself as opposable.

Not so in the case of the whole aggregate, of which these are the divisions. Of the two words,

---

* See Tab. I. Stage V. Notes 65, 66.

—the first an adjective, the other a substantive,—of which the compound appellation *Natural History* is formed,—it found, at the time of its formation, the substantive *History* already appropriated to the designation of a branch of learning, having for its subject those *states of persons and things* of all sorts, and those *events* of all sorts, that have been known or supposed to have had place in times *past:* present time either being altogether excluded, or its history being but as it were a point, in comparison of the time of history which it closes. Adding the word *natural*, say *Natural History*—the result is—that, for the import, designated by this appellative, antecedently to the establishment of that usage from which it has received an import so widely different, *we have this*, viz. the *natural* account of those *states of persons and things*, and so forth, and of those *events*, and so forth, which had place in times past.

Now with what propriety, to any one of the above-mentioned so aptly denominated divisions, of the branch of art and science itself thus unaptly denominated,—with what propriety, to Mineralogy, to Botany, to Zoology,—can the term *Natural History*, consideration had of its original and proper import as thus developed, be applied?

II. The branch of art and science, for the designation of which the compound appellation *Natural Philosophy* is in use, is that which has, for its

subject, *matter* in general, considered in respect of such modifications as it has been made, or may be expected to be made, to undergo, by human *art*, under the guidance of human *science*: with the addition, perhaps, of such properties, as, by means of changes made in it by the application of that same mental instrument, have been discovered to have been already belonging to it.

Taken by itself, *Philosophy* is *the love of wisdom*. Adding the word *natural*, say *Natural Philosophy*, and, for the import designated by this appellation, antecedently to the arbitrary usage, established in this case as in that other,—as have *this*, viz. *the natural love of wisdom*.

That either in the study of *Mechanics*, or in that of *Chemistry*, or in the study of any of those *particular* branches of art and science, which are formed by the application of these *general* and *theoretical* branches to the various *practical* ones to which they are subservient, is there any want of capacity to afford gratification to an affection so laudable as that of *the love of wisdom*,—is not here by any means meant to be asserted, or so much as insinuated. But,—not to speak of *Oratory*, *Poetry*, or any of the *Fine Arts*,—in the study of the art and science of *Legislation*, or in the study of the art and science of which *Private Morals* is the subject, is there any less room for the manifestation of the *love of wisdom*, or of *wisdom* itself, than in the study of *machines*, or in that of the various me-

thods of compounding, decompounding, and recompounding, the matter, of which *stones*, *plants*, and *animals*, are respectively composed?

III. The branch of art and science, for the designation of which the term *Mathematics* is in use, is that which has for its subject *quantity* in general, considered with or without relation to *form* or *figure*: quantity in general, that is to say, as well *matter* as *void space*, they being considered respectively in relation to *quantity*, with or without relation to *figure*: *void space*—that is, space considered as void, or rather without consideration had of its contents: for, as to any determinate portion of space, determined by determinate boundaries,—and, within those boundaries, not containing any the least particle of matter whatsoever,—an example of any such object would not, it is believed, be very easy to find.

Taken in its original import, *Mathematics* denotes any thing that is *learnt*, or considered as capable of being learnt. It therefore *is*—or at least in that its original import *was*, capable of being, with no less propriety, employed in the designation of any one of those existing, or those about to exist, branches of art and science, comprehended or not in the most comprehensive and copious Encyclopedia,—than in the designation of the particular branch, to which, by long and learned usage, it has thus, in these latter times, become

appropriated:—of the art of *legislation*, or the art of *push-pin*, no less than of *Geometry* and *Algebra*.

Upon all the above-mentioned three denominations, will not only the imperfection of *inexpressiveness*, but, in the instance of the two first of them, that of *misexpressiveness*, be found chargeable.

Running on in perpetual contradiction to the original import, a false account of the subject is the account, which the two appellations, *Natural Philosophy* and *Mathematics*, are, both of them, continually giving of it.

But, though in all these instances the proposition involved in the appellative is equally false, yet the falsehood so involved is not, in all these instances, equally pregnant with practical inconvenience.

In the instance of *Mathematics*, no very considerable practical inconvenience seems observable.

To such persons as are altogether unacquainted with the primary *general* import of the word, it conveys not any import at variance with that which, in the instance in question, it has acquired from *particular* usage: and, even to the eyes of persons acquainted with such its primary import, that *general* import has to such a degree been covered as it were, and by degrees even pushed aside, by the *particular* import attached to it by particular *usage*, as to be scarcely ever in use to present itself.

In the case of *Natural Philosophy*, the inconve-

nient effects of *unexpressiveness*, coupled as it is with *misexpressiveness*, have manifested themselves in a manner much more conspicuous and incontestable. To the same branch of art and science to which some attach the name of *Natural Philosophy*, others attach the name of *Experimental Philosophy*. In the present instance, both these terms being, as above, misapplied, are they—in the modern import of the former of them, are they,—or are they not, synonymous to each other? In relation to the *subject* to which they respectively apply, no intimation being given by either of these appellatives, —this being the case, to a question to the above effect, who shall undertake to furnish an answer?—thus much being pretty clear, viz. that for no such answer are any *data* afforded by the primary import of either of these appellatives.

Astronomy,—though, properly speaking, it should in part be considered as referable to *Natural History* (viz. in so far as it consists in simple *observations*, unaccompanied with those observations and *calculations*, which, as in the case of *Chronological Geography* and *Uranological Chronology*,* are applicable, and actually applied, to practical use—seems commonly to be considered as referable to *Natural Philosophy*, and to that alone.—Be it so: but is it then referable to *Experimental Philosophy?*

---

* See Table I.

—The *light*, that issues from them, yes: but, the *stars* themselves—are *they*, like the *star-fish*, named from them—are they taken—can they be taken—for the subjects of *experiment?*

Chemistry—this branch of art and science does it, or does it not, belong to the domain of *Natural Philosophy?*—*Yes*, say some: for, under that appellation, they include it. *No*, say others: for, under that appellation, *they* do not include it.

Belonging, or not belonging, to *Natural Philosophy*, does it not at any rate belong to *Experimental Philosophy?*—In the whole of *Chemistry*, not to say any more, taken from beginning to end, is not there full as much of experiment, as in any part of *Mechanics?*

Once more, does it, or does it not, belong to *Natural Philosophy?* On any such ground as that of *reason* and *analogy*, the question is manifestly unanswerable, and any dispute produced by it interminable. Why?—because, while one of these names, viz. *Natural Philosophy*, is not only *unexpressive* but *misexpressive*, the other—*Chemistry*—is also unexpressive. By *Chemistry*—an Arabian word, of which the origin has always been covered by a cloud—no intimation whatever, either of the *subject-matter*, of the sort of *operator*, or of the nature of any *operations* performed, is afforded.

By some Institutionalists, *Chemistry*, as above observed, is *not* considered as included in *Natural Philosophy*.—Why?—because, before *Chemistry* had

begun to find *teachers*—before any more than a few scattered fragments, of the art and science, could be so much as said to have existence—*Natural Philosophy* had, for a long time, been in use to be taught. Therefore, when *Chemistry* came to be taught, this new branch was considered as a branch of *art* or *science*, wholly distinct and independent—not included in that old one.

§ 5.—*Cause or Origin of this Inaptitude.*

Of the thus extensively prevailing inadequacy, should the *source* be asked for, it may be found, it is believed, at no great depth beneath the surface. It may be descried in the difference between the respective extents of the several divisions of the field of art and science,—i. e. of the respective masses of their contents,—in the state in which they *now* present themselves to view, as compared with the extents respectively possessed by them when, for the first time, the degree of cultivation, which they had respectively received, suggested the convenience of employing a certain name, for the purpose of binding together in the mind such of their contents, with which at that time an acquaintance, more or less correct and extensive, had been formed. In each instance, numerous, insulated, and dispersed, must have been the particular observations and experiments made, before it occurred to any one to give to the aggregate assemblage of them a common name of any kind,

and thus to bind together the contents of that aggregate by one common tie. Even when this instrument of connexion and elucidation came at length to be employed, it would at first be either altogether uncharacteristic of the objects which it served to designate,—or, if amongst them there were any, at all, to which it bore any such natural relation, the number of them would, in comparison of the number of those, to which it bore not any such relation, be very small.

Take, for instance, that branch of art and science which still bears the name of *Electricity*.—Of the word *Electricity*, the root or basis is a Greek word, which signifies *amber*: had it been from the Latin that the word had been derived, it would have been *Amberism*.—Why *Electricity* or *Amberism*?—Only because, of such a multitude of sorts of substances, as that by which, at present, upon the subjecting them to the same sort of operation (viz. rubbing), the same appearances (viz. the causing light bodies first to move towards them, and then to recede from them) are exhibited, *amber* happened to be the first, in which the existence of this property was observed.

Even *Magnetism*, though, to the purpose of calling to view, by means of its original signification, the phenomena, for the designation of which it has now for a long time been employed—though to this purpose it is so much less inadequate than *Electricity*, has had its original boundaries far outstretched

by observations made at various later dates. By its original import—by the import originally attached to it—the intimation given is, that the properties, of which it takes cognizance, belong exclusively to the *naturally* existing mineral, termed, in Greek and Latin, *Magnes*,—and, in English, *the Loadstone*.

Since those days the same properties have, however, been found to be capable of being given to *iron*—a simple metallic substance, which is but one of two or more ingredients, of which the loadstone is composed, and to belong naturally to *nickel*,—another metallic substance, which, with the exception of this property, and those that are common to all metals, has not been found to have any thing in common with either of those two other substances.

In the instance of these two branches of art and science—both of them included in the domain so unexpressively denominated by the compound appellative *Natural Philosophy*—we have two names, which, however imperfectly, are still in a certain degree characteristic and expressive: designative of a portion, though not of the whole, of the contents of the branch of art and science which they are respectively employed to denominate. In this instance of *Galvanism*, the sign is altogether uncharacteristic, with relation to every one of the objects which it is employed to signify. By an Italian, of the name of *Galvani*, within the me-

mory of multitudes now living, observation was made of certain phenomena, in which an analogy to any other class of phenomena was for some time discovered. No other object, to which they could be said to bear any particular relation, being known,—at the same time that the person, by whose sagacity and ingenuity they had been in part observed, and in part discovered, being known,—it was from him they took their name.—*The phenomena observed or discovered by Galvani*,—and presently, for shortness, *Galvanism*,—was the name given to them by the Natural Philosophers of that day.

This imperfection is not peculiar to the *physical* branch of art and science:—in a large proportion it is shared with it by the *ethical*.

From like causes proceed every where like effects. Hence, in the field of Government, the multitude of *Offices*, by the names of which not any the slightest intimation is conveyed of the nature of the operations performed by the possessors.*

* Take, for instance, the Offices respectively designated by the names *Chancellor, Secretary of the Petty Bag, Clerk of the Pells, Clerk of the Hanaper, Clerk of the Pipe, Surveyor of the Green Wax*.

§ VI. *Course to be taken for framing the most perfect and instructive System of Encyclopedical Nomenclature that the Nature of the Case admits of.*

The nature of the *subjects* themselves, and the nature of the *words* or *terms*, employed in giving to the aggregate mass of them, in all its diversifications, a system of *nomenclature*, and, by means of such nomenclature, a set of *divisions*, and thereby a scheme of distribution and arrangement—on these two circumstances, it is believed, will the aptitude of the work, with reference to its purpose, be found to depend.

1. As to the *subject*, for the particular purpose here in question, it is only in so far as concerns its primary and most extensive divisions, that an acquaintance with it will be found to be very material: with its details no other acquaintance will be found necessary, than that, by the want of which a man might be led into misconceptions, concerning the general nature of the compartments and divisions, in which they are comprehended: viz. in such sort, as, by means of some ill-chosen appellative, to ascribe to this or that one of the contents, this or that property, of which in reality it is not possessed.

In the choice made of the *words*, will be found to be included two, intimately connected indeed, but

perfectly distinguishable, particulars: viz. in the first place, the choice of such appellatives—single-worded and many-worded together—as, by the *extent* respectively belonging to them, shall be suited to the purpose of giving expression to all such divisions or parts of the subject, or aggregate, as, at each step in the progress of the division, shall be proposed to be marked out; in the next place, the *tongue* or *language*, of which choice shall have been made, for the furnishing the assortment of words required for the supply of that demand.

1. As to the *extent*, covered by the respective appellatives, it will, in the ensuing sketch at least, for all but the last step taken in the course, be such as, when they are arranged, one after another, in appropriate order, will be seen to give to the mode or scheme of division, marked out by them, the character of an *exhaustive* one, and *that*, in respect of the number of the parts produced by each act of ideal division of the aggregate, considered for that purpose as a divisible whole,—the sort of scheme, which has been styled sometimes, from the Greek, *dichotomous*; sometimes, from the Latin, *bifurcate*; literally rendered in English by the word *two-pronged*, as applied to a *fork*: for, as will be seen, it is in and by this mode, and this alone, that all the purposes, which, on this occasion, are of a nature to afford a practical use, can be accomplished. As to the considerations,

by which the choice made in favour of this mode was produced, a view of them will presently be given: but, that they may be the more clearly apprehended, it has been deemed advisable to bring to view, in the first instance, an exemplification here given of the sort of work to which they will have to make reference.*

Small, it is true, is the number of steps to which, accompanied with a correspondent system of nomenclature, this transcendently instructive and useful scheme of division can, consistently with any net balance on the side of advantage, be pursued: the number of words being so great, and not only the labour necessary to the forming of such a system, but even the labour of following it up when made, being such, as, after a comparatively small number of steps taken in this career, to threaten to become intolerable. But, against the carrying it on whatever length it is capable of being followed up to with clear advantage, every impracticability, that may be found to attach upon an ulterior pursuit of it, will not be found to oppose any reasonable objection: and a task, for which neither the mind of the writer, nor the mind of the reader, may be ripe at one period, may find both minds sufficiently prepared for it, at a more advanced point in the line of time.

As to the *language*, the *Greek* presents itself as

---

* See § 8.

being upon the whole, beyond comparison, the best adapted to this purpose: and this so clearly, as to be the only one which, on this occasion, there can be any use in holding up to view.

Reason and *Custom*—*Reason*, in this instance, the parent of *Custom*—join in the affording of this assurance. Of all known languages, the Greek is assuredly in its structure the most plastic and most manageable. To such a purpose as the present, upon a scale of any extent, it is the only language which it has been customary for men to draw upon for this purpose: customary—not only in the English language, but in the language of every other nation forming a part of the European system:—or, in a word,—as, to this purpose, may be said for shortness, and without any very material injustice, in the language of every well-instructed nation upon earth.

Of the sort of work proposed to be executed, the *subject* has already been brought to view, and its limits marked out, it is hoped, with that degree of precision which the nature of the case admits of: viz.—of the whole field of *thought and action*, that part which constitutes the field of *art and science*: the *field* itself, or—what comes to the same thing (both expressions being necessarily *figurative*—names of *fictitious entities*—) the aggregate of its *contents*.*

---

* See Table I. Note (9).

Of the *division* to be made of this *field*—or (what comes to the same thing) the *distribution* to be made of its *contents*—where shall we look for the *source?*—the primary source, by the choice of which the choice of all ulterior sources, should any such be added, will naturally be influenced at least, if not determined?—Where, but in the different natures of different *parts* of this *field*—of different portions of its *contents?* in a word, in the nature of the *subject*—the common *subject* of all these branches of *art* and *science*—and in the different natures of the several different parts of that subject, on which these several branches have to operate? So far as it is from this source that the division is made—the *principle of division* deduced—correspondent to each branch of the *subject* is the branch of *art* and *science*, by which it is operated upon: and, conversely, correspondent to each branch of *art* and *science* is that branch of the *subject* on which it operates.

In the preface, written by D'Alembert, and prefixt to the French Encyclopædia, under the title of *Systême figuré des Connoissances Humaines—Figured System of Human Knowledge*,* a systematic Table or Map is given, accompanied with a paper, entitled, *Explication détaillée du Systême des Connoissances Humaines.*

---

* *Knowledges* would be the word, if—in English as in French—the substantive *knowledge* had a plural number.

In that sketch, what is the declared *subject* of the work?—Art and Science in conjunction?—No: but *sciences* when to the exclusion of arts; for surely, under the French word *connoissances*, *arts* are no more included, than under the English word *knowledge*, or the English word *science*. Yet in the Table itself the words *Art* and *Arts* occur in many places.

Again, the *source* of division, or—to begin with the first division which presents itself—the source of that leading division, what is it? Is it the nature of *the subject*—the different natures of the several different branches of the subject, on which the corresponding branches of art and science have to operate?—No: but the nature of the *faculties*, by means of which, the subject, in its different parts, is (it is supposed) operated upon.

Lastly—the plan or *scheme* of *division*,—considered in respect of the number of branches, which are respectively the results of the several successive acts of *partition* or *distribution*, performed upon it?—what is it? Is it, as above proposed, *regular* and *bifurcate?* the number, at the first step, two; and, at every step the same?—No: but, at the first step *trifurcate:* and, after that, the number at each step varying, to the number of half a dozen or more.

Such is the scheme, or plan of division, pursued in that justly celebrated work: in these may be

seen a part, and but a part, of the whole number of its incongruities: and, of some of the practical *inconveniences*, resulting from some of these *logical* incongruities,—if, on the ground of science, *confusion*, and on the one part *misrepresentation*, and on the other part *misconception*, belong to the category of inconvenience—it will be the endeavour of the next section to give a view.

§ VII. *D'Alembert's Encyclopedical* (*) *Map or Tabular Sketch—its imperfections.*

Of the sketch given by *D'Alembert*, the leading principles are,—as he himself has been careful to

---

* The denomination *Encyclopedia* had established usage, and perhaps even necessity, to warrant it.

Considered, however, in its original import, viz. *instruction in a circle*—it is not in every respect a very happy one. Moving continually in a circle, is not the way to get on. By labour, speed may indeed be increased; but by no degree of either can any advance be made. Thus, at the very outset, and by the very name, an irrelevant idea is obtruded, and in lieu of that encouragement which is so much needed, discouragement is presented.

The image of a *field* presented itself as being in every respect much better adapted to the purpose. By the image of a circle, is presented the idea of a limited extent, determined by the circumference. By the image of a field no limitation whatsoever is presented.

This image of a *field* will moreover be, with equal convenience, applicable to two expanses—two perfectly distinguishable, though intimately connected expanses, one within the other—

declare,—taken from that given by *Lord Bacon*. Had it been entirely his own, it would have been, beyond comparison, a better one. For the age of *Bacon*, Bacon's was a precocious and precious fruit of the union of learning with genius: for the age of *D'Alembert* it will, it is believed, be found but a poor production, below the author as well as the age.

Prudential considerations suggested to the French Philosopher the precaution of seeking shelter under the mantle of the foreign sage. But of this perhaps in another place.

Ingenious as, in several parts, and in several respects, it would, upon a particular examination, be found,—smoke, rather than light, will, upon the whole, be seen to be the result of it. At the very first step, the whole field, it will be seen, is involved in an all-obscuring cloud: a cloud too thick for any ulterior operation to be capable of dissipating.

---

the one of them boundless, and so therefore the other—viz. the field of *action* and *thought*—and the field of *art* and *science*.

In the pursuance of this *necessary* fiction—(for all language, which has *mind* for its subject, is unavoidably fictitious—speaking of *mind* as if it were *matter*)—on the occasion of the use made of this necessarily fictitious image, there will be found a convenience in speaking—sometimes of the ideal *receptacle*—the *field*—as if it were a real one, sometimes of the *objects* in question, viz. the several branches of art and science, in the character of its *contents*. By the word *field* this convenience will always be afforded.

Its principal merit and use will, it is believed, be seen to consist in the having formed, and presented to view, a general conception of a work of this sort,—and the having placed together, under one view, the whole stock of the materials, at that time known to belong to it, and to require to be employed in the composition of it.

Taking the work in the form in which it is exhibited by D'Alembert, the following are among the imperfections, which have presented themselves as chargeable upon it—

1. The very *subject* of the work, inadequately designated.

2. The *primary source* of *division*, unhappily chosen.

3. The *scheme of division*, loose and irregular.

4. The *appellations*, in several leading instances, *inapposite*.

5. The *distinctions*, in several instances, *groundless:* distinctions, without any determinate and assignable difference.

6. *Repetitions abundant:*—under different names, the same object repeated a multitude of times.

7. The *texture* of the discourse *incomplete:* no *verbs;* consequently no *propositions:* nothing but *substantives*, with here and there an *article* or an *adjective*.

I. *Subject of the work, inadequately designated.*

Of the relation between *Art and Science*,—as well as of the relation between Art and Science *taken together* on the one part, and the *remainder* of the whole field of *thought* and *action* on the other part,—the idea above given* will (it is hoped) be found a tolerably clear one. Of this relation, no attempt to give any idea is made in *D'Alembert's Map*, or in the *Explanation* given of it.

"*Systême figuré*"—figured system,—of Human *Knowledge*—des *Connoissances* Humaines, is the *title* under which the whole contents of the Table are arranged. At the conclusion, even *Poetry*, presented to view in the character of the principal product of the *imagination*,—is at the same time exhibited in the character of a subject, or a branch, of the all-comprehending aggregate—human *knowledge*.† In the same paragraph, and but four

---

* Table I. note (9).

† Voilà toute la *Partie Portique* de la Connoissance Humaine ; ce qu'on en peut rapporter à l'imagination, et la fin de notre distribution généalogique (ou si l'on veut Mappemonde) des Sciences et des Arts.....*D'Alembert Melanges*, i. 239. *Amsterdam*, 1767. *Explication du Systême figuré.*——N. B. The above, as far as it goes, is an exact copy of the original: but, as in the grammatical structure of the passage some deficiency in the articles of clearness and correctness presents itself, some slip of the press is suspected.

lines after, he speaks of this Table, by the description of "*a Genealogical Distribution or Map of the Sciences and the Arts;*" and, in this loose shape, and no other, is introduced the only mention made of *the Arts*, or the word *Art*. And, though *fiction* is mentioned as an essential ingredient in the composition of the idea meant by him to be attached to the word, yet neither on this occasion, nor on any other, is it brought to view in the character of the name of an *Art*, nor in any other character than that of the name of a branch of *Science*.

From the difficulty here in question, the mind of D'Alembert, it therefore appears, withdrew its force. His precursor, *Chambers*, in the Preface to his Dictionary had, before him, grappled with it; but (as any one, who, in this view, may be disposed to turn to that elaborate work, will, it is believed, find reason to acknowledge) altogether without success.

Instead of *Knowledge*, in which (see Chrestomathia, Table I.) *Science* is included—instead of knowledge alone, the subject of the work in question should then have been *Art and Science:* art and science all along *in conjunction:* for, in conjunction they must all along be taken and considered, or no tolerably adequate conception of either will be formed.

But the *subject* of *art and science together*, what is it?—Answer—*Being* in general: *being*, in all the

modifications, of which, to our view, it is susceptible. *Being*, in some shape or shapes, the *subject*, —*well-being*, in some shape or shapes, the *object*,—of every thing that, by man, is or can be *done* or *thought of*. Of these fundamental and eminently simple truths, the bare mention may suffice for the present. In the section, in which some of the *first lines*, of the sort of *map* in question, are attempted to be given, the consideration of them will come to be resumed. As the process of division and distribution,—drawn as the principle of division is from different *sources*,—as this sort of anatomical process proceeds, the several modifications of *being* which are the result of it, display themselves to view.

II. *Primary Source of Division, ill chosen.*

The primary *source* of his divisions is—what? Not the nature of the *subject*, and of its respective parts,—but, as already noticed, the nature of the several human *faculties*, which, by a strange misconception, are respectively considered as applying themselves exclusively to different parts of it.

Strange indeed may this misconception be pronounced: at any rate, if it be true, that, when these faculties come to be mentioned, so it is that, of all the branches into which the body of the arts and sciences has ever been or ever can be divided, not a single one can be mentioned, upon which the

whole list of the human faculties can not be shewn to be, in some way or other, applied.

Memory—Reason—Imagination.—Of these, and these alone, is his list of the human faculties—as brought forward on this occasion—composed. If, for any other purpose—if, on any other occasion—asked for a list of those faculties, would D'Alembert have given this for a complete one?—*Perception*, for example—not to look any further—would not *this* have been added? would it not have been placed before *Memory?*—But the truth is—that in the subsequent ramifications, though not in this primary one, not only *perception*, but other faculties besides, are by D'Alembert himself brought to view.

But, for this purpose, what list of these faculties, other than a complete one, could, with propriety, have been proposed to serve? In addition to these three,—each of which, according to this division, applies itself exclusively to a certain parcel of the branches of *art and science*, or at any rate of *science*—is it that there are any, of which no application is made to *any* branch of *art* or *science?* Of the faculty of *perception*, for example, is it that no application is made, in the study of *Natural History* for example? If, either in this or in any other instance, any such faculty be to be found,—if this be indeed a truth,—it surely is not of the number of those truths, which are so completely obvious, that no proof of them can, either for con-

viction or satisfaction, be justly regarded as necessary.

Quere—unless it be through the *perceptive faculty*, through what medium does the *retentive* receive any of the original, and exteriorly derived, part of its contents?

Of a set of fictitious entities to give in a list, neither the correctness nor the completeness of which shall be exempt from dispute or doubt, cannot be a very easy task. Of the articles inserted in the Note, neither the *perceptibility*,—(meaning of that sort of perceptibility of which these sorts of fictitious entities are susceptible)—neither the perceptibility, nor the mutual *distinctness*,—say rather *distinguibility*,—will, it is hoped, be found much exposed to dispute.*

---

*1. *Perception*—or say *perceptive faculty: alias simple apprehension.*

*2. *Judgment*—or say *judicial faculty.*

*3. *Memory*—or say *retentive faculty.*

*4. *Deduction*—or say *ratiocination*, or *deductive faculty*:—that by which a number of judgments, i. e. acts of the *judicial faculty*, are deduced one from another.

5. *Abstraction*—or say *abstractive faculty.*

6. *Synthesis*—i. e. *combination.*

*7. *Imagination*—or say *imaginative faculty*, whereby a number of *abstracted ideas—results*, or *products* of the exercise of the *abstractive faculty*—are combined, compounded, put together as

☞ Of those which are here distinguished by an * mention is made in D'Alembert's Table: those and no others.

The *inventor*, the *learner*, the *teacher*—the *inventor*, or in the place of, or in company with the

---

it were into one *image*. It is combination, preceded by, and operating upon the products of abstraction.

8. *Invention*—or say *inventive faculty*, whereby, out of a number of the products of the *abstractive* faculty, such compounds are formed as are *new;* i. e. were never produced before. *Invention* is *imagination*, directed in its exercise to the attainment of some particular *end*.

9. *Attention*—or the *attentive faculty*. The exercise of *this* faculty seems to be the result of an exercise of the *will:* of a special application made, of the power of *that* faculty to the purpose of attaching to this work with different *degrees of force*, and for different *lengths of time*, any one or more of the several distinguishable faculties above-mentioned.

10. *Observation*.—In this are included, *perception*, *memory*, *judgment*, and commonly *ratiocination*, set and kept to work by *attention*,—and directed commonly in their exercise to the accomplishment of some particular *end*.

11. *Comparison*. This is an application made of the faculty of attention and judgment. In this case the attention applies itself alternately to the objects which are the subjects of it: viz. for the purpose of descrying their mutual relations to each other.

12. *Generalization*. This is a mode of *imagination:* i. e. from the observation of one or more individuals, perceived or supposed to be endued with a certain property, *imagination* of an indefinite number of individuals, regarded as being possessed, each of them, of a property of that same sort. It is *combination*, performed by the *imagination*, and guided by *observation* of analogy, i. e. similitude.

13. *Induction:* i. e. *deduction*, or say *ratiocination*, applied as a result of the process of *generalization* as above, followed by a *judgment* accordingly passed, pronouncing that the sort of con-

inventor, the *discoverer*, and their assistant, the *observer*—in regard to every branch of science, be

---

formity so *imagined* has, in the instances in question, been *realized*.

14. *Analysis*—i. e. *division* (literally *resolution*)—viz. *logical*, or say *noological* analysis. This is the converse of *generalization*; and supposes that operation antecedently performed. By the combination made of the ideas of a multitude of individuals, or sorts of individuals, in virtue of some property, which is supposed to belong to them in common,—and which is thus made to serve as a bond of ideal union, by which they are bound together into one *aggregate*, and that aggregate recorded and fixed by one common name,—*generalization* is performed. By the *division* and *sub-division* of an aggregate thus formed,—correspondent names, whether single worded or many-worded, being either formed or made for the several parts, which are the results of the several acts of division and sub-division,—*analysis*, i. e. the *resolutive* division and decomposition of the antecedently formed artificial aggregate, is performed.

Thus, in the *Porphyrian tree*, as in the annexed Table, working in the direction of *generalization*, and setting out either from *Homo* or *Brutum*, or from a sub-species, or an individual of either species, you may arrive—immediately, or through *sensitivum*, *vivens* and *corpus*,—all or any of them—at least at *substantia*. Working in the direction of *analysis*, the course you take is exactly the reverse.

By *imagination*, the idea and practice of *logical*, *noological*, *metaphysical* analysis—was deduced from that of *physical*. Physical is either *mechanical* or *chemical*: *Physical* analysis is an instance of a *real* and *material* operation; *logical*, of an *immaterial*, and thus, in some sort, a fictitious one,—of the same name.

A term, which will be apt to be considered as not only the opposite, but exactly co-extensive, correlative of *analysis*, is the

it what it may, by these different sets of persons, different faculties, or sets of faculties, are put into exercise.

---

above-mentioned term *synthesis*:—*analysis*—literally, *resolution*; *synthesis*, literally, *putting together*; *analysis*—literally, *resolution*, i. e. *putting asunder*. If the coincidence were thus complete, *synthesis* and *generalization* would be exactly synonymous, and ought to be interconvertibly employed. This, however, is not the case. Of any number of ideas, how heterogeneous so ever, the putting together may be termed *synthesis*. But, in so far as the term *analysis* is applied, the ideas, comprehended in the subject in which the operation is to be performed, are by the supposition *homogeneous*. The subject analysed is an aggregate or *genus*, which is divided into *species*, those into *subspecies*, and so on. The only case in which *synthesis* is exactly opposite and correspondent to, and no more than co-extensive with synthesis, is when between the ideas put together there is that sort of conformity from which the act of putting them together receives the name of *generalization*.

Analysis and *synthesis*—*analytic method* and *synthetic method*—are locutions which are but too frequently to be found employed, on occasions in which the import meant to be attached to them is far from being clear and determinate. The same operation which by one person is called by one of these names, shall by another person be called by the other. By giving to every supposed explanation the name of *an analysis*, *Condillac*, in his Logic, thinks he has explained every thing: and thus it is that he explains nothing. *Analysis* (he says) *is nothing but a language well-made*. He sees not, that it is of an act of *synthesis* (the declared object of his antipathy) that every name, which is not, in the grammatical sense, a *proper* name, is the sign and the result: and that, were it not for that despised and much vituperated agent, his favourite and exclusively lauded instrument would not have a subject on which to operate.

15. *Methodization*

What the *inventor* is in relation to *art*, the *discoverer is*, in relation to *science*. In art and sci-

---

15. *Methodization*—or say *arrangement*—or the exercise of what (if a *faculty* is to be imagined for the purpose) may be called the *tactic* faculty. It may be employed, with little or no exception, in the service of every one of the above-named faculties, in the exercise of which the *attention* is employed. By it, for giving facility to *comparison*, objects are *imagined* to lie in a certain order; for example, *above*, *below*, or *by the side of* one another.

16. *Distribution*. In effect this is, generally speaking, much the same sort of operation as *Division*: but, for presenting that effect to view, a somewhat different image is employed. In the case where the word employed is *division*, whatsoever may be the parts, or elementary articles contained in the subject, they are considered as antecedently aggregated into one *whole*: whereupon, in proportion as the operation proceeds, that whole is divided into *parts*. In the case where the word employed is *distribution*, whatsoever may be the subject on which the operation is to be performed, the parts or component articles, whatsoever they may be, which are considered as belonging to it, are considered as lying in a state of separation from each other.

When, a multitude of articles being considered as co-existing, no *aggregation* of them is considered as having been made, no *division* can be considered as being capable of being made: consequently, in this case, *distribution* is the only one of the two instruments of method that the nature of the case can be considered as admitting of.

17. *Communication*—or the *communicative faculty*: a faculty which may have for its *subject*, the results or products of the exercise of any one or more of the several faculties above-mentioned.—*Speaking*, *writing*,—and *pantomime*, i. e. discourse by *gestures*, or otherwise by *deportment*—are so many modes, in and by which it is exercised.

Communication,

ence, not merely every existing branch, but every the minutest twig, must have given exercise to the *inventive* faculty, ere it could have come into existence. *Invention*, as above, is *imagination*, taken under command by *attention*, and directed to the accomplishment of some particular *object*, or *end in view*. The products of the exercise of the *abstractive faculty* are the materials of which the work of the imagination is composed. Among the objects of invention or discovery, is *method*: and, when once invented or discovered, it becomes an instrument in the hands of *Invention*, of *Discovery*, and of *Observation*. It is by Natural His-

---

Communication, on the one part, supposes *receipt*; or say *reception* on the other. In so far as, to the exercise of the act of *reception*, *attention*, on the part of the *receiver*, is considered as necessary—the *receiver* is styled a *learner*.

For *correctness*—viz. as a *test* of, and *security* for that quality—for correctness, as well as clearness, this test would require a correspondent list of examples. But, for any such additional quantity of matter, neither time nor place can here be afforded. In its present form it must, therefore, be left to stand; in its present form, and with all its imperfections.

An intricate subject of discussion would be—the order in which the several articles might be most advantageously disposed, and made to follow one another. What shall be the principle of arrangement? Shall it be priority? But from this source no decision can be deduced, as between a number of operations which are performed at the same time.—Shall it be *degree* of *simplicity*?—From this source some light seems to be reflected on the first steps: but, when multitudes flock together, with equal forwardness, this light is extinguished.

tory, in greater proportion, than by any other branch of art and science, that exercise is afforded for *observation* and for *method:* next to that by those branches which have *mind* for their subject.

Abstraction, Imagination, Invention, Discovery, Methodization, Communication—of none of these faculties does the *learner*, as such, find in himself any demand for the exercise: *attention* and *observation*,—applied to the impressions and ideas, which are respectively the products of the exercise of the several faculties of *perception, judgment, memory,* and *ratiocination*,—for the exercise of all *these* faculties, but for that of no *others* than these, does the situation, occupied by the *learner,* as such, afford a demand.

To the faculties, for the exercise of which the situation of the *learner* affords a demand, that of *teacher* adds that of *communication:*—of communication, and, in so far as, in the *method* which he employs, there happens to be any thing which was thought of by him, without its having, to his knowledge, been thought of by any other person, *invention.*

Without any the slightest notice taken of any of these distinctions,—*Poetry,* with its nearest branches, in vast capitals, and those next to them still in great and upright ones,—after Poetry, *Music, Painting, Sculpture, Civil Architecture,* and Engraving,—these, and no others, are, by D'Alembert, huddled together in a corner, and,—as if standing in awe of

Poetry, and should they presume to place themselves on a line with her, fearing the lash of one of her daughters, viz. *Satire*,—are dressed—in capitals, indeed, but *those leaning* ones,—and, in comparison of those which are not refused to *Madrigal*, *Epigram*, or *Romance*, scarcely visible. These too are all together placed under the head of *imagination*; as if, in the first place, to the exercise of all *these* branches of art, the exercise of imaginative faculty, were necessary,—and as if, in the next place, it were not so to any of the *others*.

Yet, when once pointed out, who is there that does not recognize—that neither to the *Musical* performer, nor to the *Painter* as such, nor to the *Sculptor* as such, nor to the *Architect*—or, in plain English, the *Builder*—as such, nor to the *Engraver* as such, is any exercise of the *imaginative* faculty necessary?—Yes: in so far as, by any of them, any thing *new* is to be hit upon: but, in this there is nothing which they do not possess, in common with the artist in every other line whatsoever.

Aristotle was an *observer* and *inventor*: for by him was invented, how far soever from perfected, the art and science of *Logic*, school-mistress of all the *other* arts and sciences. *Bacon* was an *observer* and *inventor*: for by him was invented the art of *learning Natural History* and *Natural Philosophy*, more particularly the latter. *Newton* was an *observer*, a *discoverer*, and an *inventor*. *Locke* was an *observer* and a *discoverer*: his *field* of discovery,

the region of mind.—*Linnæus* was,—*Werner* is,—an *observer* and *inventive*, and thereby *imaginative*, *methodizer*:—which of these men was ever a *Musician*, a *Painter*, a *Sculptor*, a *Builder*, or an *Engraver*?

Placed where it is, the word *Reason* is, of itself sufficient to involve the whole subject in a cloud. To the production of confusion and dismay, had that been the purpose, it would have been but too effectually adapted: clear conceptions, placed where it is, it is not in the nature of it to bring to view.—What is the object meant to be presented by it?—*Answer.* One of the faculties of the human mind.—What, then, is this faculty?—*Answer.* The faculty called the *ratiocinative* or *inductive* faculty, including, of course, the *judgment*, or *judicial faculty*.—What, then, is *Reason*? *Answer.* It is a name, which, on *some* occasions, and only on some occasions, a man is wont to give to the ratiocinative faculty, or the exercise of it. What then are these occasions? *Answer.*—Those, and those alone, on which the exercise, which he considers as given to it, is such as he approves of.—Here, then,—instead of that *neutral* sort of appellation, which alone is suitable to the purpose—viz. that sort of appellation, of which the words *induction* and *inductive faculty*, *judgment* and *judicial* faculty, as well as the words *memory* and *imagination*, are exemplifications,—the appellative, em-

ployed for the designation of the *ratiocinative*, including the *judicial* faculty, is an *eulogistic* one.

Of the act of misappellation thus committed, now then observe the consequence. Of every application made of this word, in the designation of the faculty in question, the effect being—to attach to it a latent proposition, expressive of the *approbation* of the speaker, as annexed to the exercise given to the faculty,—one consequence is—that, without a contradiction in terms, it cannot be employed, on any occasion, in which it is the intention to bring that exercise to view, in the character of an object of disapprobation; or even to avoid bringing it to view in the opposite character.

Thus it is, that of the *three* leading terms in question, while *two* are, as far as they go, proper and suitable to the purpose, between them is thrust in another, which mismatches them—and communicates to the whole group its own delusive colour.

Memory and *Imagination*—it is by the *Logicians*, that *these* two appellations, simple and suitable as they are, were taken in hand. *Reason*—it is of the *Rhetorician* that this appellative was the choice. In the word *Reason* may be seen one of that numerous set of names of *fictitious entities*, in the fabrication of which the labours of the *Rhetorician* and the *Poet* have been conjoined. In *Reason* they have joined in giving us a sort of *Goddess:* a God-

dess, in whom another Goddess—*Passion*—finds a constant antagonist—and a third Goddess, *Religion—Reason's* elder sister—sometimes a troublesome rival, sometimes a useful subordinate. It is not by any such mythology, that any clear and correct instruction can be conveyed.

Under the head of *Memory*—under that one head—are arranged the contents of the whole field of *Natural History*, together with those of the field of *History*, simply and properly so called:—under the head of *Reason*, the contents of the field of *Natural Philosophy*.

In regard to the distribution thus made, thus much is indeed true, viz. that in the formation and retention, of ideas relative to the subject of *Natural Philosophy*, the quantity of exercise given to the ratiocinative faculty,—more particularly in so far as the art and *science* takes for its subject the relation between *cause* and *effect*,—is commonly greater than the quantity of exercise given to *another* faculty?—But, this *other* faculty—what is it?—Not the *Memory*, to which the two philosophers refer so much; but the *Perception* or *Apprehension*, to which they refer nothing.

Scarcely has even *History—History*, in its narrowed and most usual sense, viz. an account of *states*, of *things*, and *events*, as they are supposed to have had existence in times past—scarcely in this limited sense can *History*, with more propriety than *Natural History* or *Natural Philosophy*, be said

to belong to the province of *the Memory*. To the *Memory*, it is true, almost exclusively, before the invention of the art of *writing*, must all successive generations have been indebted, for whatsoever notions they could have obtained and retained, concerning the states of things and events, that had had place in the respectively preceding generations. But,—of a state of things, or an event, that had had place at an antecedent point of time, when the description had once been expressed and fixed, in and by the permanent sort of signs, which are the product of that mind-exalting art,—a man's faculty of bearing it in mind was no more dependent upon *memory*, than his faculty of bearing in mind the matter of any other branch of art and science:—the correspondency, for example, between the acquisition of mechanical *power* and the sacrifice of *dispatch*,—the composition of *water* and respirable *air*—or the equivalency, of the sum of *all the angles* that can be constructed round any given point, to that of *four right ones*.

A circumstance which, at the times respectively in question, these philosophers seem not—either of them—to have been aware of, but which, when once brought to view, will not be found the less undeniable, is—that not only the practice and knowledge that has had place, in relation to *international intercourse*, and *internal Government*, but every other branch of Art and Science—every one as well as every other—has its *History*.—*Natural*

History, Natural Philosophy, Poetry, Music, Logic,—every thing. In relation to *War* and *Government*, has the state of this part of the universe, presented itself at different times, in different shapes?—so has it in relation to *Mechanics*, to *Chemistry*, to *Poetry*, to *Music*, and so on.—(Not to speak of the *future*, which, to our limited view, is, all of it, in a state of *contingency*)—the distinction between the *past* and the *present*—to what portion of the whole field of thought and action—to what portion of the known field of existence---does it not apply itself.

Placed under the head of *Memory*, the title *Irregularities of Nature (Ecarts de la Nature)* presents itself in the character of a blotch, to which a sponge might apply a not incongruous cure.—Natural, and but too excusable, in *Bacon*'s time, it was not equally so in *D'Alembert*'s. In the time of the English Philosopher, the mind was annoyed and oppressed by terrors, which, in the time of his French disciple, had lost—though not the whole—the greater part of their force. In *Bacon*'s time—in the early part of the 17th century—every thing in nature that was, or was supposed to be, *extraordinary*, was *alarming*;—alarming, and, in some shape or other, if not *productive*, *predictive* at least of human misery. In this place, as in other places—at this time, as at other times—*Ghosts* and *Witches* composed a constant part of the population, *Devils* an occasional one. Patronized by *Queen Elizabeth*, Dee had not long ceased to hold converse with his

disembodied intimates: *Lilly* was preparing for the connexion he succeeded in forming with *his*. To burn heretics, to hang witches, and to combat devils, were operations, for all which Bacon's Royal Patron held himself in equal and constant readiness.

Celestial Prodigies—Prodigious Meteors—Prodigies on *Land* and *Sea—Monstrous Minerals—Monstrous Vegetables—Monstrous Animals—Prodigies* of *the Elements*—by D'Alembert, all these (alas!) are exhibited in the character of so many distinct classes of the subjects of human knowledge—distinct classes of things—subordinate, and standing next in subordination, to the including class denominated as above, *Irregularities of Nature*.—This too under title *Memory*:—for most of them at least, the *Imagination* might have been a more apposite one.

In the days of *Bacon*, battles on dry ground were scarcely more common than *battles in the air*:—in the thin element, peace had assuredly been already pretty well established in D'Alembert's time.

Placed under the head of *Reason*,—*Divination* and *Black Magic* were perhaps two whiffs of necessary incense offered up to the *Archbishop of Paris*: subjects, if not branches, of that science which had for its already declared subjects "*spirits beneficent* and *malificent*," for the expulsion of the latter of whom the Ritual of that Most Reverend person

furnished him with weapons, to which they had never been known to oppose any effectual resistance,—those gems in the panoply of theological warfare could not then be spared:—but, by that oblation, his appetite for the supernatural might, one should have thought, been satisfied, without the addition of so many swarms of monsters.

At present, at any rate, much, it is believed, will hardly be found to be said, in favour of a principle of Classification, by which a *middle-sized* man is placed in one niche, a *tall* man and a *short* man *together* in another.

In the ancient order of things, commencement precedes accomplishment—trial precedes success: *experiment* upon a *small* scale precedes *establishment* upon a *large* scale. In each and every part of the field, *experimental researches* must necessarily have preceded those *established practices*, of which the products of *handicraft arts*, *manufactures*, and the arts called *fine arts*, are the results. Accordingly, in the sketch attempted in the next section,—exhibited under the new name, proposed as a substitute to this its present trivial one, *Experimental Philosophy* precedes *Technology*—the branch of *science* which belongs to the necessary and more useful part of the *arts*.

Not so in D'Alembert's. In *that*, it is under the general head of *Natural History*, that we see ranked what concerns all *finished* products of the *Arts*, with their *et ceteras*, as above: while, by the still more

general head *Memory*, intimation is given—if not that it is by the exertion of that single faculty that they are *produced*,—at any rate, that it is by that one alone of all the human faculties, that any thing *else*, in relation to them, is either *known* or *done*.

A dislocation so strange—by what train of thought can it have been produced?—From the terms of the Table, a sort of conjectural answer may be collected.—By every exercise given to *Art*, some production of *Nature* is put to *use*. Accordingly, *Arts*, (handicraft) *Trades* and *Manufactures*, are there exhibited, in the character of exemplifications, of the "*Uses* made of *Nature*."—But, by the same title, might not *Poetry* be ranked under the head of *Natural History?* and its fruits—an *Epic* or *Dramatic* poem, for example—represented as being the work of *Memory*—or, at any rate, as belonging, in some way or other, to the *province* or *faculty* of *Memory?* For, the *brain*, by which it was dictated, as well as the *pen* by which it was written,—not to speak of the *gall nuts*, the *sulphate* of *iron*, and the *water*, by which the pen was enabled to give permanence to the marks traced by it,—what are they—any of them—but so many works of *Nature?*

III. *Scheme of Division, loose and irregular.*

§. 6

In a former section (§ 5.) the *dichotomous* or *bifurcate* mode of division, performed upon the *ex-*

haustive principle, has been already brought to view, in the character of the only one perfectly suited to what ought to be the design of the *first lines* of an *Encyclopedical Map* or *Table*. Of the *considerations* or *reasons*, by which its claim to that character was suggested, a view will be given in an ensuing section.

At the same time the observation was made—that, with the regularity and comprehensiveness which characterize that mode, the mode pursued in this Map of *D'Alembert*'s forms a striking contrast.

Of the existence of this character in it—of this *imperfection*, if such it should be deemed—it would be useless to present to view, in this place, and in this manner, any protracted chain of proofs. By a single glance at the Table, they will be seen all together:—for the assistance of the first steps of such a survey, a few words will be sufficient at least, if not superfluous.

Common Trunk, the *understanding*. Ramification of this trunk into *three* branches: viz. *Memory*, *Reason*, and *Imagination*:—division, trifurcate. Under *Memory*, placed *History*: no division. Under History, *Sacred*, *Ecclesiastical*, *Civil*, *Ancient* and *Modern*, and *Natural History*:—division, *quadrifurcate* or *quinquefurcate*. Under Natural History, *Uniformity of Nature*, *Irregularities of Nature*, and *uses* made of Nature:—division, *trifurcate*.—Of title *Uniformity*, seven *branches*: of title *Irregula-*

rities, seven. By the side of title *Uses made of Nature*—terms put in apposition, *Arts*, (handicraft) *Trades*, and *Manufactures*:—division, *novemfurcate*: the list of *nine* branches, concluding with an *&c.*; each of them having its own branches, each concluding in like manner with an *&c.*

Thus much under *Memory*: and, without proceeding onwards either with *Reason* or with *Imagination*, this sample will assuredly be found sufficient.

IV. *Appellations inapposite.*

Of this species of imperfection no exemplifications worth noticing have been observed, other than those, with which the language he found in general use, stood chargeable,—and of which the principal samples have, in this Essay, been already brought to view. (§ 4.)—These are, 1. *Natural History*—2. *Philosophy*:—(not, as with us, *Natural Philosophy*, but simply *Philosophy*:) *under* which comes *Physics*. *Physics* is divided into *general* and *particular*: but under neither of them is *Natural History* (that being ranked under *History*) included.—3. *Mathematics*.

The promise, which it fell to his lot to give, being the promise of a body of information, relative to all the branches of *art* and *science*, which were, or were at that time considered as being, in existence,—that which it was necessary his Map

should contain, viz.—a collection of those *names* by which they were respectively in use to be designated, and by which and which alone they were generally known. Under these circumstances, whatsoever might be the imperfections which any of these denominations might be found labouring under, with none of them could this intelligent philosopher be justly chargeable: and it appears not that to this established stock of imperfections any of his own making have been added.

V. *Distinctions groundless:*—unwarranted by any determinate, and assignable, correspondent difference.

Of this species of imperfection, several exemplifications may be seen under the ensuing head of *Repetitions*.

VI. *Repetitions abundant:*—under different names, the same objects presented to view a number of different times.

Four times over, in the character of subjects of *Memory*, are the several classes of known bodies, of which the earth's surface is composed, brought to view in this Table: viz. 1st, under the name of *Meteors;* 2dly, under the name of *Earth* and *Sea;* 3dly, under their own distinctive names—viz. *Mi-*

nerals, Vegetables, and *Animals;* 4thly, under the name of *Elements.*

Four times?—Yes: and also *four* times *more:* viz. all such of them to which it should at any time happen to present to the eye of the reader—whoever he may be—any thing, which, to that same eye, shall appear to have in it any thing that is *extraordinary:* as if *ordinary* and *extraordinary* were any thing more than *relative* terms: relative—not to the nature of the objects themselves, but to the position, occupied at the moment, by the mind, by which they are respectively viewed: as if the same object, which to a preceding generation had been *extraordinary,* had not become *ordinary* to a receding one.—Such as they are, here they follow. —1. *Prodigious Meteors,* or Meteoric Prodigies. 2. *Prodigies* on *Earth* and *Sea.* 3. *Monstrous Minerals.* 4. *Monstrous Vegetables.* 5. *Monstrous Animals.* 6. *Prodigies of the Elements.*

Not content with thus presenting them, *eight* times over, in the character of *objects* or *subjects* of *memory,* once more are we made to see these same beings,—and *now* in the character of *objects* or *subjects* of *Reason:*—for, still they are the same existences, and even viewed under the same aspects, notwithstanding the termination *logy* (in the French, *logie*), which now forms a termination to the Greek word, by which they are respectively brought to view. Meteors are now represented—in the first

place by *Meteorology*, then presently once more by *Aerology*: *Minerals*, first by *Geology*, then presently once more by *Mineralogy*: *Water*, by *Hydrology*: *Vegetables*, by *Botany*—divided, and not improperly, into *Agriculture* and *Gardening*.

Meteors (as already observed) *Meteors*—i. e. *meteoric*, (meaning neither more nor less than *elevated*) bodies or particles—are,—what are they—what can they be but—bodies or particles, of the number of those of which the earth's surface is composed?—only mixt up with that part of it, which is mostly in a *gasseous* state, and then detached, to a distance more or less considerable, *above*, i. e. *beyond* that principal mass, which is partly in a *solid*, partly in a *liquid* state?—masses, consequently composed, in different and ever varying proportions, of matters belonging respectively to the three great *kingdoms*, as they are called—the *mineral*, the *vegetable*, and the *animal*.

Yet, in the character of a sort of subject—and that a distinct one—of *Natural History*, *D'Alembert*, as we have seen already, places *Meteors*, and *that* in a situation anterior to the situations respectively allotted to *Minerals*, *Vegetables*, and *Animals*: and to them he *subjoins*—as if they were constitutive of a distinct class of objects—*Elements*:—a word which in trivial language is indeed employed even now: but which had had its rise, in modes of thought and action, which, even in *D'Alembert*'s time, were already antiquated and exploded.

Four in number, as every body knows, used to be these elements: viz. Earth, Water, Air, and Fire. *Earth*—a term employed to designate any mass of matter whatsoever, in so far as it is considered as being in a *solid* state:—*Water*—a term employed to designate a mass of the same matter, when in the liquid state;—a mass of matter, which is itself the same, though, by its being thus designated by a different appellative, represented and spoken of as if it were different:—*Air*—a term by which the self-same mass is once more designated, when considered as being in the *gasseous* state:—*Fire*—a word, to which no determinate idea was ever annexed, but which is wont to be employed, whenever, in conjunction with an extraordinary mass of *light*, an extraordinary mass of *caloric*, i. e. *heat*, is perceived to issue from the same spot.

In a manner not unsuitable to our situation, and thence to our mode of contemplating objects of all sorts,—the world—i. e. all that part of it, in relation to which it has been within our power to obtain any the smallest and faintest spark of knowledge—has by some been divided into *Earth* and *Heaven*: *Earth*—the globe which we inhabit: *Heaven*—comprehending all other globes—all other bodies—whatsoever. Accordingly, such is the conception, by which the Philosopher seems to have been guided, while *Memory* was the presiding deity. First comes *Celestial* History, and without any division: then comes *History by itself*, followed by

its several adjuncts—viz. *Meteors*, *Earth* and *Sea*, and so forth, as above.

In conformity to this part of the plan—when, furnished with Greek-sprung names, with the termination *logy* tacked to each name, the same objects or subjects came to be put under the presidence of *Reason*,—*Science de la Nature*—(*Natural History* not having, it should seem, been recognized in the character of a *science*, but only as a sort of *knowledge*, different from, and employed to prepare the way for, *science*)—*Science de la Nature*, followed by its synonym *Physique particulière*—should have been branched out—in the first place into *Cosmologie* and *Geologie*, and after that *Geologie* into *Meteorelogie*, *Mineralogie*, and the other *logies*, according to the method which, as above, had already been observed. Instead of *that*, follow the particulars, in an order which,—besides being, with relation to that in which the same objects had already been arranged, so completely incongruous, —is, in itself, so completely perturbate, that to delineate, in the form of a continuous discourse, those intrinsic incongruities, which, after *this* intimation,—at any rate with the help of the ensuing sketch—may be discovered by the examination of about forty words, (such being the number contained in this part of D'Alembert's sketch) might afford full work for as many pages.

Branches of the *Science of Nature*, alias *Particular Physics*, seven: viz. 1. Zoology: 2. *Physical Astro-*

nomy (as if there were an *Astronomy* that was not *Physical*). 3. *Meteorology*. 4. *Cosmology*. 5. *Botany*. 6. *Mineralogy*. 7. *Chemistry*. Thus, in the first place, *Animals* of all sorts—then the *Stars*—and then (whatever they are) the *Meteors*—are brought to view—and that by *Reason*—before any such receptacle as *a world* has been found for them to exist in: and, between *animals* and the *plants* on which they have to depend for their existence, this same whole *world*, as soon as it is found, is placed, besides all the *stars* and all the *meteors*.

In company with this *Figured System (Système Figuré)*—and antecedently to it, is presented by the Author, as above noticed, an "*Explanation*" of it. For an explanation, and therein for a justification, of the sort of order, a sample of which has just been exhibited, reference to the above *Explanation* was, of course, made. Of this reference, what was the result?—that the order pursued in the Explanation was, on this part of the ground, altogether different from the order, given to the articles which it professed to explain. This too after his having observed, in so many words, that, p. 233, "*Particular Physics ought to follow the* SAME *distribution as Natural History.*"*

In this same *Explanation* another strange inti-

---

* La physique particulière doit la même distribution que l'histoire naturelle, p. 233.

mation is given: and such is the store set upon it, it is repeated through the whole course of several pages. This is—that, so long as under the presidence of *Memory* you are studying *Natural History*, (in which he includes the history of all the *arts*, except the *fine* ones), you are to make use of your *senses* and nothing more: on the other hand, when you come to the study of the same objects under the presidence of *Reason*, then it is, that for the first time you are to apply to them the faculty of *reflection*, and so long as *that* is at work, you have no occasion for your *senses*:* What perhaps might be found to be true is—that in the study of *Natural History*, rather more use is made of the senses than in that of *Natural Philosophy*,—in the study of Natural Philosophy, rather more use is made of the faculty of *reflection* than in the study of Natural History. But he who should attempt to do any thing in *Natural History*, without being at any expense in the article of *reflection*, or in *Natural Philosophy*, without making any use of his *genius*, would assuredly find it very up-hill work.

---

* De l'histoire, prise par les sens, des *Astres*, de *leurs mouvemens, apparences sensibles*, &c., la réflexion a passé à la recherche de leur origine, des causes de leurs phénomènes, &c., et a produit la science qu'on appelle *Astronomie physique* ..... De l'histoire, prise par les sens, des *vents*, des *pluies*, &c., ... la réflexion a passé à la recherche de leurs origines, ... &c.—*Il-*

VII. The nature of the discourse *incomplete*:—no *verbs* in it; consequently no *propositions*:—nothing but *substantives*, with here and there an *adjective*.

By this sort of discourse—if discourse it can be called—for want of the necessary indispensable tie, or *copula*, as the logicians and grammarians call it, which is afforded by the part of speech called a *verb*, no complete assertion being contained in it, no determinate information is conveyed.

By nothing short of an entire proposition can any such conveyance be made. True it is, that *nouns*, and in particular noun *substantives*, are the principal materials out of which the sign of an assertion is composed: but still, without the *copula* no determinate assertion is formed. Set down any two, or any greater number of substantives, out of these same materials, one man will make one sort of proposition, another man another, and a third man will not know what to make of them. Of the readers—that is, of the persons for whose instruction the work is intended—some, it is possible there may be, whose conception of the work, when executed, may be adequate to that which the workman—the instructor—had in his mind, at the time he executed it. But that such will be the case

with the generality of readers,* is surely not the sort of supposition on which a work of this sort ought to be grounded. Destitute of this principle of fixation and bond of union, objects may, in innumerable multitude, and endless succession, be presented to the mind,—and, after all, leave in it an impression, not more durable than that which is left in the waters, by a vessel by which they have been traversed.

To the sort of sketch, a sample of which is attempted in the ensuing section, a Tabular Sketch, jotted down in this unconnected mode, will be found to bear much the same sort of relation, as a stock of bricks, mortar, and timber, deposited by the side of each other, bears to a house. Thus, instead of a structure, ready put together for use, the reader, out of the materials thus shot down before him, is left to make one for himself as well as he is able. The learner is left, and called upon, to do for himself, what the teacher, perhaps because he knew not how to do it, has left undone.

Several causes concur, in recommending to the

* By the writers on Rhetoric, a certain degree of unconnectedness being, in certain cases, capable of rendering the discourse more impressive, and, in its operation upon the passions, more efficient, is, under the name of *asyndeton*, i. e. that which is without *connectives*, brought to view in the character of a *rhetorical figure*. But the connectives, which on that occasion are in view, are—not *verbs*, but *conjunctions*:—conjunctions *copulative*.

hand of the *workman* this mode of executing the work. In comparison of the opposite mode, the value given to the work in this mode is indeed small, and the interest of the *customer*—the *learner*—proportionably ill-served. Not so the interest of the workman—the *instructor*—Over all errors and all ignorances a very convenient veil is every where spread by it. 1. No assertion at all being contained in it, no false assertion—no erroneous judgment—can be imputed to it. Scarcely in any way can a man thoroughly commit himself, by any thing which he has inserted, still less by any thing which he has omitted to insert, in it.—2. Yet, by a too natural misconception, the less the instructor has in this case done for his pupil, the more he is thought to have had it in his power to do, or even to have done. By this form of discourse, if discourse it can be called, an air of mysticism and oracularity is cast over it. This was among the characteristics of the *Egyptian hieroglyphics*. Ideas, such as they are, suggested in abundance: but, among them, no such thing as an *assertion* to be found. Only in proportion as it is understood, is language of any use. Whatsoever is obscure is, in proportion to the obscurity, unintelligible. Speaking thus obscurely and unintelligibly, is it that you are *unable* to speak plain, or is it that you are *unwilling?* If unwilling, what but *deception* can be your object.—Such are the questions to which

every discourse stands exposed, in proportion as it is obscure.

Yet to these materials for thinking—loose as they were—profound, in former ages, was the depth of wisdom that was ascribed: to those loose materials for thinking, out of which the best thoughts that could have been made would, probably, have been, most, if not all of them, foolish ones. At the same time, while the understanding of the reader is thus left in this comparatively unsupplied state, his vanity is gratified: to do what the philosophers have left undone, affords to those who have a taste for it, a pastime; a pastime, in the course of which, as many little triumphs may be reaped, as there are propositions that can be put together out of such materials as it supplies.

Sketches of this sort, on a variety of subjects, are assuredly not wanting, in which D'Alembert may have found so many precedents, and thereby so many warrants, for this unconnected, and, to the reader, so little instructive,—but, at the same time, to the author, so much the most convenient,—mode. If, unconscious of any such warrant, he had regarded it as matter of obligation, to employ that mode which was best suited to the end in view, none but the *connected* mode would have presented itself to his view: the conception he would thus have been forced to frame to himself, would have been correspondently clear, and the work would

have appeared, in a form very different from that in which it meets the eye at present.

All this while, to the French philosopher, circumstanced as he was, the choice of this inadequate form was matter—not so much of *policy* alone, as of *necessity*. But of this perhaps in another place.

Whether, *in any place*, it is in the nature of any such speculations, as the above, to be of any real use—to render to mankind any perceptible service—whether for speculations of this sort, and to this effect, *the place* in which they are thus brought to view is a *fit* place—these are, among the points in which, in his own way, every reader will pronounce his own judgment. By any one, whose patience may have carried him thus far, thus much at any rate will, it is believed, be admitted, viz. that if, at the time when that Table was made public, there existed, on the ground of utility, any real demand for a Table of that sort, that demand has not, by any of the information therein given, been superseded.

§ VIII. *Specimen of a New Encyclopedical Sketch, with a correspondent Synoptic Table, or Diagram.**

Directly or indirectly, *well-being*, in some shape or other, or in several shapes, or all shapes taken

---

* See Table IV.

together, is the subject of every thought, and object of every action, on the part of every known *Being*, who is, at the same time, a sensitive and thinking Being. Constantly and unpreventably it actually is so: nor can any intelligible reason be given for desiring that it should be otherwise.

This being admitted, *Eudæmonics*, in some one or other of the divisions of which it is susceptible, or in all of them taken together, may be said to be the *object* of every branch of *art*, and the *subject* of every branch of *science*. *Eudæmonics**—the *art*, which has for the object of its endea-

---

* [*Eudæmonics.*] From a Greek word, which signifies happiness, originally, *attended by a good genius.*

For reasons already given (see § 6.), and according to the usage, which, with great advantage, has place as above-mentioned, in regard to newly devised scientific names, the following ones are mostly taken from the Greek: explanations of them, in English, are subjoined; and that for two reasons; one is—that, among the persons to whom speculations of this kind may be not unacceptable, there may be many, to whom the Greek language is not sufficiently familiar, to render the denominations in question, in every instance, readily intelligible to them, even supposing those denominations constructed with perfect propriety;—the other is—that the words will, probably, not be in every instance so well adapted to the giving expression to the intended meaning, as, with the help of a less imperfect acquaintance with the language, they might have been made.

The quantity or degree of *well-being*, experienced during any given length of time, is directly as the *magnitude* (i. e. the *intensity* multiplied by the *duration*) of the sum of the pleasures, and

vours, to contribute in some way or other to the attainment of *well-being*,—and the *science* in virtue of which, in so far as it is possessed by him, a man knows in what manner he is to conduct himself in order to exercise that art with effect.

Considered in the character of an *edifice* or *receptacle*, *Eudæmonics* may, therefore, be termed the *Common Hall*, or *central place of meeting*, of all the *arts* and *sciences* :—change the metaphor, every *art*, with its correspondent *science*, is a branch of *Eudæmonics*.

---

inversely as the *magnitude* of the sum of the *pains*, experienced during that same length of time.

In so far as the sum of the *pleasures* of all kinds, experienced by the person in question, during the length of time in question, is regarded, as *considerable*,—the sum of the *pains* of all kinds, experienced by him during that same length of time, being, moreover, laid out of the account,—the state which in that respect he is regarded as being in, is termed a state of *happiness*.

In so far as the sum of the pain of all kinds, experienced by the person in question, during the length of time in question, is regarded as considerable,—the sum of the *pleasures* of all kinds, experienced by him during that same length of time, being, moreover, laid out of the account,—the state which, in this respect, he is regarded as being in, is termed a state of *unhappiness*.*

* Any person, to whom this account of *happiness* fails of being satisfactory, may find a very different one given by *James Harris*, in that one of his "*Three Treatises*," published together in one octavo volume, which takes *Happiness* for its subject and its title; but from no part of which would any person suppose, that any such dark spot as that of *unhappiness* is any where to be found.

If the above observation be correct, it is only in one or other of two shapes or characters, viz. that of a *source of happiness*, or that of a security against *unhappiness*, that *being* can in any of its modifications, possess any claim to man's regard.*

Eudæmonics being the name for the universally practised *art*—the *pursuit of happiness*,—*being* in some of its various shapes, will be allowed to be an

---

* The *summum bonum* is a fruit of the tree of *pure good*, upon the taking of which into his mouth, a man experiences at one and the same time every pleasure of which in the nature of a sensitive being he is susceptible, each in the highest degree; pains of all sorts at the same time keeping aloof, so long as this precious fruit remains in any part of the *primæ viæ*.

It is the kernel of that fruit, of which the *philosopher's stone* is the shell. It was lately found by Baron *Munchausen*, in the Island of *Medemusia*, after a careful search made, in pursuance of the directions given by *Aristotle*, *Plato*, and *Cicero*, in whose philosophical repasts,—as, in the codes of those universally admired masters of ethical science, any body may see,—it formed a constant article.

By *Cicero*, in his Tusculan Questions, it has been made plain, to the perfect satisfaction of his *Auditor*, (a most perfectly well-bred young gentleman, whom he introduces to us by that name,) that *pain is no evil*. But the truth is, as the *philosopher* confessed to the *Baron*, that, during the whole of this dialogue, they were both of them chewing the *summum bonum nut*, to which the *areca*, even when wrapped up in the *betel* leaf, forms a very inadequate substitute. The consequence was—that, all that time, to the philosopher and his agreeable young friend, pain was no evil, whatsoever it may have been, and be about to be, to the vulgar of that and other ages.

indispensable *means*, without which the object of that art cannot in any instance be pursued and attained. *Sensitive being* is the only *seat* of happiness: *being*, in that and other shapes, is the universal *instrument* of happiness. To the attainment of happiness in any shape or degree, an acquaintance, more or less considerable, with the *seat* of happiness, and with such *beings* as, in each instance, afford a promise of serving in the character of *instruments* of happiness,—is more or less conducive, or even necessary. For the designation, of whatsoever portion of science may be regarded as capable of being attained, concerning *being* taken in its utmost conceivable extent,—the word *Ontology* has, for ages, been in possession of being employed.

Eudæmonics is the art of *well-being*. Necessary to *well-being* is *being*. In every part, therefore, of the common field,—concomitant and correspondent to *Eudæmonics* considered as an *art*, runs *Ontology*,* considered as a *science*.

For the expressly declared *subject of division*, let us take the *science*: art and science running along every where together, every division performed on the one, may, on any occasion, be considered as applying to the other.

---

* [*Ontology*.] From two Greek words:—one of which signifies *being* in general; the other, *an account*:—an account of *being* in general.

By means of this joint consideration, as often as, on looking at the name of a branch of art and science as it stands in the Table, we come to consider its *nature*, our attention will be pointed to the only source and measure of its *value*.

Familiar as is the name, the idea commonly attached to that appellation has hitherto been subjected, by usage, to a restriction, which is not exactly conformable, either to the present purpose, or even to the etymology and original signification of the word, as above. The case is—that, by all those philosophers, by whom, under this name, any instruction has been undertaken to be given, those properties alone have been either considered, or professed to be considered, which have been regarded by them as incident to *all* beings without distinction: such as *actuality*, *possibility*, *necessity*, *impossibility*, *probability*, *improbability*, *certainty*, *simplicity*, *compositiness*, power of *causation*, *derivation* from a cause,—and so forth.

Coenoscopic * and *Idioscopic* †—by successively

---

* [*Coenoscopic.*] From two Greek words: one of which signifies *common*—things belonging to others in common; the other *looking to*. By *Coenoscopic outology* then is designated that part of the science, which takes for its subject those properties, which are considered as possessed in common by all the individuals, belonging to the class which the name *outology* is employed to designate: i. e. by *all beings*.

In the word *Coenobite*—less properly spelt *Cenobite*—the first of these words has already a footing in the language. In the

attaching to the subject *Outology* these too adjuncts, the field of art and science may thus be divided, the whole of it, into two portions; in one of which, viz. the *coenoscopic*, shall be contained the

---

words *microscope, microscopic,—telescope, telescopic,*—and several others designative of philosophical instruments,—the termination —*scopic* is become perfectly familiar.

The termination *-scopic*, in what cases shall it be employed in the formation of the appellative?—On the one hand, in many instances it is either indispensably necessary, or at least highly conducive, to the intelligibility of the word; on the other hand, in every instance it adds to its length, and in some instances would probably be found to render it too unwieldy for use.

Cases, in which it will (it is supposed) be found indispensably necessary to complete the intended signification, are as follows: viz. 1. *Mesoscopic*, as applied to *Eudæmonics:* 2. *Morphoscopic*, as applied to *Posology:* 3. *Abioscopic*, as applied to *Physiurgic Somatics:* 4. *Embioscopic*, as applied to ditto: 5. *Pathematoscopic*, as applied to *Pneumatology* or *Pneumatics:* 6. *Thelematoscopic*, as applied to ditto: 7. *Esoscopic*, and 8. *Exoscopic*, as applied to *Ethics:*—for the etymology and explanation of all which, see the ensuing pages.

Cases, in which it may be dispensed with, whether as being altogether unnecessary, or as being less indispensably necessary, are those, in which the import, intended to be conveyed by it, may, without difficulty, or with little difficulty, be understood to be expressed by the more customary terminations —*logy* and —*logical*,—or the still shorter, though less expressive, termination—*ics*.

Instances of terminations already in use are, 1. *Physics*. 2. *Mechanics*. 3. *Pneumatics*. 4. *Mathematics*. 5. *Statistics*. 6. *Ethics*. 7. *Politics*—and various others. In *Logic*, the final *s* has, for this long time, been omitted.

† [*Idioscopic.*] From two Greek words, the first of which

appalling and repulsive branch of science, to which the no less formidable, and to many a man intensely odious, appellation of *metaphysics*, is sometimes also applied: while to the other—viz. the *idioscopic*—all the other branches of art and science, may, without distinction, be consigned.

Division the 1st. Division of Outology into 1. *Coenoscopic*, and 2, *Idioscopic*.

Matter and *mind*—into these two portions, *being* in general, considered as an aggregate, is wont to be considered as divided. Hence arises,

2. Division the 2d. Division of Idioscopic Outology into *Somatology*,* or *Somatics*, and *Pneuma-*

---

signifies *peculiar*. In *Idioscopic Outology* then we have that branch of art and science, which takes for its subject such properties, as are considered as peculiar to different classes of beings: some appertaining to one such class, others to another.

In the words *idiom, idiomatical, idiosyncracy*, and a few others, though none of them in any very common use—this word has already a footing in the language: a footing, better known in some instances than in others.

Coenosyncratocoscopic and *idiosyncratocoscopic* might be somewhat more expressive, but would be too long-winded. *Coenosyncratic* and *idiosyncratic* would scarcely be equally expressive: —*syncratic*, from *syncrasis*, i. e. *commixture, composition, constitution*.

* [*Somatology.*] From two Greek words, the first of which signifies *body, matter*, or *corporeal substance*.

tology,* or *Pneumatics*,† alias *Psychology*, or *Psychics*.

---

* [*Pneumatology.*] From two Greek words: the first of which (πνευμα) signifies *spirit*, i. e. *incorporeal substance*, in the sense in which it is used as synonymous to *mind*: in their original sense, the Latin as well as the Greek word corresponding to the English word *breath*. In the New Testament, αγιον πνευμα is the name, employed in the original, in designating the object, for the designation of which, in the English version, the compound appellative *Holy Spirit* is employed: more frequently (according to a phrase, which, when, on other occasions, applied to other objects, is either obsolete, or expressive of a different class of beings or supposed beings) *Holy Ghost*. In this sense, *pneumatology* and *pneumatics*, as well as *psychology*, are already in use: though more upon the continent than in Britain.

If, on this occasion, and in this sense, the word *pneumatics* were employed, it would need to cease being employed in the sense in which it is at present wont to be employed: viz. that in which it designates the branch of art and science, which has for its subject *bodies in general*, considered as being in the state, which, since *Chemistry* has become a science, has been termed the *gasseous* state.

By the name of *materialists*, stand distinguished a set of philosophers, of whom *Priestley* was one, according to whom there exists not any such created being as a *mind* distinct from matter: for that *that* which is called *mind* is but an assemblage or collection, of the sort of fictitious entities called *properties*, with which certain species of *matter* are endowed. One of the grossest imperfections, that could be chargeable upon any Encyclopedical system, would be found to attach upon it, if, by the unnecessary assumption of any proposition, which by any class of men were regarded as false, the effect of it were to render itself so far: i. e. with reference to that class of men, unfit for use.

To

In the consideration bestowed upon *body*, the mind may confine itself, or not confine itself, to that property which belongs alike to all

---

To the use of this class of philosophers, this division may be sufficiently accommodated by a very slight change of phrase, as thus.—To *pneumatology* belongs the consideration of such bodies or portions of matter, as are endowed with the aggregate mass of properties collectively styled *mind*, considered in relation to those same peculiar properties.

† [*or*] On this occasion,—as on every other on which *certainty* is an object,—an imperfection, attached to the English language, presents a very distressing impediment. It consists in the ambiguity inherent in the import of the conjunction *or*. Inserted between two words,—noun-substantives suppose,—it is employed with equal frequency, and without any the least discrimination, for two purposes altogether different: and is thus continually liable to give rise, either to interminable uncertainty, or to any the most delusive and most mischievous misconceptions. The one is—that of giving to understand that what is meant to be said of the thing signified by the one, is not meant to be said of the thing signified by the other: the other, that they are but two words for one and the same thing: not to speak of a third case, in which the option is meant to be given between two things, for the designation of which the two words are employed. In other words, it is employed in either of the two so widely different senses, distinguished by the grammarians of classical antiquity, and, after them, by *Harris*, in his *Hermes*, by the two *adjuncts*, *disjunctive* and *sub-disjunctive*: *disjunctive*, when the two words are meant to be exhibited in the character of names of two different things; *sub-disjunctive*, when they are meant to be represented as different names of one and the same thing.

A more frequently occurring, or a more frequently pernicious, imperfection will not easily be found in any language.

From this great blemish, the Greek language, as observed by

body, and even to every determinate portion of *space* unoccupied by body, viz. *quantity*. Hence arises

Division 3d. Division of *Somatics* into *Posologi-*

Harris, is altogether free: it has one word for the *disjunctive* sense, and another for the *sub-disjunctive*.

Even the French language either is already exempt from this imperfection, or at any rate, with comparatively little difficulty, might be rendered free from it. *Ou*, or *ou bien*, it is believed, is *the* diction, or at any rate *a* diction employed, where the purpose is to present to view the *disjunctive* sense: employed it assuredly is in this sense, and, it is believed, seldom if ever employed in the other: while, when put between two substantives, *soit* is indubitably employed in the sub-disjunctive sense, and seldom if ever, it is believed, in the disjunctive.

In English, if *or*, being confined to the disjunctive, *or say* were the diction employed, and that exclusively, where the sense meant to be presented is the *sub-disjunctive*,—a blemish, so incompatible with certainty and clearness of conception, might thus be removed. But supposing the improvement were ever so desirable, how the introduction of it could be effected seems not very easy to conceive. The inconvenience of departure from habit is an inconvenience, which, in such a case, would be felt by every body: by every body, as well in the capacity of *speaker* or *writer*, as well as in that of *hearer* or *reader*.

The uneasiness produced by every violation of the law of custom, in matters of discourse, is a sort of uneasiness to which every body, without exception, is more or less sensible: precision—avoidance of certainty—is an inconvenience to which, though in many cases so, more seldom than the other is in any case, few indeed are sensible.

For this same purpose—sub-disjunctive sense—the Latin word *alias*, a word already applied to this same purpose, would serve full as well, were it not for the displeasing idea attached to it by the use made of it on the occasions on which it is employed, in speaking of this or that man of bad character, who, to elude jus-

*cal** Somatic and *Poeological*† Somatics.—To avoid an inconvenience above brought to view, for an equivalent to *Posological Somatics*, may be employed the single-worded appellative *Posology*.

In the consideration of *quantity*, that of *figure* may be either taken into account or neglected. Hence arises

Division 4th. Division of Posology into *Morphoscopic*‡ Posology, and *Alegomorphic* or Alegomorphous§ Posology. By *Morphoscopic* Posology is denoted the same branch of art and science, for the designation of which the not altogether *unexpressive*, yet but *inadequately expressive*, term *Geometry* is the word in use.

In so far as it is without relation to *figure* that

---

tice, has, at different times, assumed different names. For conveying to the eye the import in question, the well-known letters, *i. e.* might in some measure be made to serve: but *id est*, of which they exhibit the abbreviation, is crude Latin: and the correspondent English phrase would be felt to be insufferably long.

* [*Posology.*] From two Greek words, the first of which signifies *quantity*.

† [*Poeology.*] From two Greek words, the first of which signifies *quality*.

‡ [*Morphoscopic.*] From two Greek words: the first of which signifies *shape, form,* or *figure*; the other, *regarding*: from the first comes the English word *metamorphosed—changed* in respect of *figure*.

§ [*Alegomorphic.*] From two Greek words: the first of which signifies *disregarding* or *not regarding*; from the other comes the English verb *to metamorphose*.

quantity is considered, the only diversification, of which it is susceptible, is of that sort, for the expression of which the several modifications of which *number* is susceptible are employed. By *Alegomorphic* or *Alegomorphous Posology*, is here designated the same branch of art and science, for the designation of which the single worded and adequately expressive appellation *Arithmetic* is the word in universal use.

Of a quantity, for the designation of which no more than one numerical figure, or one line of such figures, no matter how long, so it be an uninterrupted one, is employed,—the amount is considered *as known:* i. e. by itself: the conception of it being, in so far as it is capable of being conveyed, conveyed in a *direct* way,—and without need of the intervention of any other set of signs,—to the mind of every person, by whom the import of these same figures, placed in that position with relation to one another, is understood.

Of a quantity, for the designation of which any two or more such lines of *numerical* figures,—or one or more single figures, together with one or more such lines of figures,—are employed, the amount is not, in a *direct* way, as yet known: for practical purposes it is not sufficiently known, until the *composite* expression, composed as above, has been transformed, or *translated* as it were, into a *simple* expression, consisting, as above, of some one single numerical figure, or some one single

line of numerical figures, the elements of which are free from all such interruption as is produced by the interposition of any other sort of sign. To substitute to any other more complicated mode the simple mode of notation thus described, is what every operation of simple arithmetic has for its object.

In and for the designation of *numbers*, a convenience has, comparatively speaking, of late years, been found in the employing, in addition to numerical figures,—and even on some occasions, or during some part of the operation, in lieu of numerical figures,—signs of another kind, not varying in their signification, according to the order in which they succeed one another, in the same way as do the component elements of a line of numerical figures: of these newly devised signs, such as are capable of being ultimately translated into those which are composed of numerical figures, have, for a long time past, universally and exclusively been composed of the letters of the alphabet. But by none of these recently employed signs can any quantity ever be expressed in a *direct* manner:—in any other manner, than by reference to some single numerical figure, or line of numerical figures, ranged in arithmetical order, as above. Hence arises

Division 5th. Division of *Alegomorphous* posology, into *Gnosto-symbolic*,* or say *Delo-symbolic*,†

* [*Gnosto-symbolic.*] From two Greek words: the first of which signifies *known;* the other, *a sign,* or *belonging to a sign.*

and *Agnosto-symbolic*, or say *Adelo-symbolic*:* *Gnosto-symbolic* or *Delo-symbolic* being the term employed for the designation of the branch, for the designation of which the term *common Arithmetic* is in use to be employed, *Agnosto-symbolic*, or *Adelo-symbolic*, is the term, employed for the designation of that, for the designation of which the inadequately expressive composite appellation *Algebraical Arithmetic*,—or, much more frequently, the single-worded and completely unexpressive appellative *Algebra*,—is employed.

II. To return to *Poelogical Somatology*, or *Somatology* at large.—Where bodies are considered, it may be either *with*, or *without*, reference to any operation, performed upon or in relation to them, by human *art*, by the help of human *science*.—Hence arises

Division 6th. Division of *Somatology*, or *Somatics* at large, into 1. *Physiurgic*† and *Anthropurgic*.‡

---

† [*Delo-symbolic.*] From two Greek words, the first of which signifies *manifest*, or manifestly known.

* [*Agnosto-symbolic.*] [*Adelo-symbolic.*] Prefixt to a word, the Greek particle *a* frequently, as in these cases, is significative of *negation*:—of the *negation* absence, for example, or *absence* of any quality, to the denomination of which it is prefixt.

† [*Physiurgic.*] From two Greek words: the first of which signifies *nature*; the other, *work*, or *belonging to work*: the art and science which has for its subject those properties, the *production*

This division has for its source the consideration of the absence or presence of human art and science, applied to the purpose either of discovering *latent* properties already belonging to the subject, or of investing it with new ones. *Physiurgic Somatology* has for its synonym the above-mentioned *mis*expressive appellation—*Natural History*.

Anthropurgic Somatology has for its synonym the still more flagrantly and perplexingly *mis*expressive appellation *Natural Philosophy*, taken in one of the two or more different degrees of extension, which, as above, have been given to it.

Applied to *bodies*, alias *portions of matter*, in their *natural*, or say *physiurgic*, state—*human art*—or say *elaboration by human art*—has two distinguishable objects: sometimes it is to the one, sometimes to the other, sometimes to both, that it is directed. These are, 1. the discovery of such properties, as—already, and before it has, by the application of human genius and industry, been endued with any new properties—it is in posses-

---

and *display* of which are the work of nature alone, unmodified by the intervention of human genius and industry. In several instances, the termination formed by the latter word is, in this same sense, already in the language: viz. in *chirurgy* (from whence *surgery*), *energy*, *liturgy*, *metallurgy*, *theurgy*.

‡ [*Anthropurgic.*] From two Greek words: the first of which signifies *Man*:—the art and science, which has for its subject those properties, either the *production* or the *discovery* and *display* of which, are the work of human genius and industry.

sion of, having been put in possession of them, as it were, by the hand of *Nature*: 2. the giving to it, in addition to, or instead of, any such properties as it is found endued with by the hands of Nature, some *new* property or set of properties.

Intimately connected, and in many instances, inextricably blended and intermingled, are, it is evident, these two functions: the detection of an *already existing* property or set of properties, being very often a *condition precedent*,—and always, in so far as it affords suitable indications, an encouragement, —to the engaging in any such operations as are found conducive to the faculty of investing the subject with *new* ones.

Of *Physiurgy*, alias *Natural History*, the object and business is—to discover and observe the properties possessed by objects, in the state into which they have been brought by the powers of unassisted *Nature*. But, to the bringing them for that purpose to view, and presenting them in a state as little changed as may be, *new* properties are, in many instances, requisite to be given to them: nor, in general, would the labour necessary to the accomplishment of this purpose be bestowed upon them, but in the view of investing them with *new* properties:—properties, by which they will be brought into some state or other, better adapted to human use, than any, into which they had been brought by the hand of *Nature*.

Division 7. Division of *Physiurgic Somatology*, or

say *Physiurgics*, into *Uranoscopic* * and *Epigeoscopic* † *Physiurgics*.

Uranoscopic Physiurgics has for its single-worded synonym the adequately expressive appellative *Astronomy*.

Division 8. Division of *Epigeoscopic Somatology* into *Abioscopic*‡ and *Embioscopic*§ *Somatology*: say *Abioscopic* and *Embioscopic Epigeoscopics*.

Abioscopic Physiurgics has for its synonym the adequately expressive and single-worded appellative *Mineralogy*.

Division 9. Division of *Embioscopic Physiurgics* into *Azooscopic*,‖ *Azoologic*, or *Azoic*, and *Zooscopic* or *Zoologic* Physiurgics.

---

* [*Uranoscopic.*] From two Greek words, the first of which signifies *heaven*, or say *the heavens*.

† [*Epigeoscopic.*] From three Greek words: the first of which signifies *upon*; the second, *the earth*.

‡ [*Abioscopic.*] From two Greek words, the first of which signifies *that which has not life*.

§ [*Embioscopic.*] From two Greek words, the first of which signifies *that which has life*.

‖ [*Azooscopic.*] From two Greek words, the first of which signifies that which has not *animal*, i. e. *sensitive* life.

To *azooscopic* might be added, for a synonym, *anæsthesioscopic*; and to *zooscopic*, the correspondent synonym, *æsthesioscopic*. *Anæsthesioscopic*, from two Greek words: the first of which signifies that which is not endowed with *sensation*, i. e. *feeling*. The word *æsthetics* has already a footing in modern language, and even in the English: though as yet not so much employed in the English as in some of the *continental* languages, particularly the *German*. It is used to signify the doctrine concerning

Azooscopic Embioscopics has, for its synonyms, the adequately expressive and single-worded appellations already in use—*Botany* and *Phytology*.

Zooscopic Embioscopics has for its synonym the adequately expressive and single-worded appellative already in use—*Zoology*.

Beyond this point, no adequate advantage seems to be promised, at least on the present occasion, by the task of carrying on, in this direction, that track of *dichotomous* or *bifurcate* division, which, at the expense of much labour to the workman,—and not less perhaps to the small number of *amateurs*, that can reasonably be looked for,—has thus far been persevered in.—By the words *Zoophytology*, *Entomology*, *Erpetology*, *Ichthyology*, *Ornithology*, *Tetrapodology*, and *Amphibiology*,—having for their respective subjects, *Plants*, *Animals*, *Insects*, *Reptiles*, *Fishes*, *Birds*, *Beasts* alias *Quadrupeds*, and *Amphibious* alias *Land-and-Water Animals*,—so many divisions of *Zoology* have for this long time actually been, or, in virtue of powers granted by *Analogy*, may, at any time, be—in use to be designated.

Division 10. Division of *Anthropurgics*, or say *Anthropurgic Somatology* or *Somatics*, into *Coenoscopic** or *Phanerodynamic*† *Anthropurgics*, and

---

what belongs to *taste:* viz. as applied to literary composition, and the arts called *Fine Arts:—feeling*, principally of the *mind*, considered as applied to the productions of those arts.

* [*Coenoscopic.*] See above, note, p. 177.

Idioscopic * or *Cryptodynamic* † *Anthropurgics.*

Coenoscopic or *Phanerodynamic Anthropurgics* has for its single-worded synonym the inadequately expressive appellative *Mechanics:* viz. when taken in the most extensive sense of the word: i. e. that in which it is employed to include whatsoever portions of *Anthropurgic Somatics* are not comprehended within the domain of *Chemistry.*

Idioscopic, or *Cryptodynamic Anthropurgics,* has for its single-worded synonym the unexpressive appellation *Chemistry.*

The properties, of which *Mechanics*—or, as the phrase is, *Mechanical Philosophy,*—takes cognizance, are for the most part such as belong to *all* matter, taken in all its *forms* and *species:* by this circumstance it is that this branch of Art and Science is entitled to the appellation of *Coenoscopic Anthropurgics,* or *Somatics.*

These properties are moreover, in comparison of those which belong to the subjects of the other just-mentioned branch, *manifest,* or say *conspicuous,* of themselves; not requiring the aid of human art

---

† [*Phanerodynamic.*] From two Greek words: one of which signifies *conspicuous;* the other, *power.* The word *Dynamics,* as applied to designate a branch of Mechanics, is already in use in modern languages; ex. gr. in the *English;* but not so much so as in the *French.*

* [*Idioscopic.*] See above, note †, p. 178.

† [*Cryptodynamic.*] From two Greek words, the first of which signifies *latent* or *unconspicuous.*

to bring them out to view: in this circumstance it is that this same branch founds its title to the appellation of *Phanerodynamic*.

These properties being mostly, if not altogether, such as, in the common course of scientific language, come under the denomination of *powers*, —hence, in speaking of this division of art and science, it has been thought that, on this occasion, a word corresponding to *powers* might, by contributing to clearness of apprehension, be not altogether without its use.

The properties, of which *Chemistry* takes cognizance, are for the most part, such as belong— not to all matter, nor to matter in *general*, but to this or that *particular* species of matter, as distinguished, each of them from the rest, by such a collection of these properties as, taken in the aggregate, belongs peculiarly to itself. By this circumstance it is that this branch of art and science entitles itself to the appellation of *Idioscopic Anthropurgics*.

These properties are, moreover, in comparison of those which belong to the branch just mentioned, recondite and unconspicuous: requiring,— to the *production*, and, in some instances, as it were, to the *creation* of them,—more or less of human art and elaboration, consisting chiefly in *mixture*, and in the application of different degrees of *temperature*: changes—which, in so far as the phenomena of *heat* and *cold* are considered as being the

result of the absence or presence—the influx or efflux—of a particular species of matter, termed *caloric*, or the matter of *heat*, may also be considered as referable to the head of *mixture*.

Accordingly, in the adequately expressive appellative, *Mixiology*, or *Symmictology*, should any clear advantage be ever found derivable from the use of it, the originally unexpressive term *Chemistry* might at any time find an equally single-worded, and by no means unexpressive synonym.*

Division 10. Division of *Anthropurgics* into *Anapirical*, or *Anapiric*,† and *Catastatical*, or *Catastatic*.‡

---

* By the word *Crasiodiæresics*, a more adequately expressive—and, though a compound, yet still a single-worded appellative—might be afforded. By it, in addition to *mixture*, *decomposition* would be designated: and, of a chemical operation, even without mixture, decomposition is sometimes the result.

† [*Anapiric.*] From a Greek word, which signifies *experimental*. *Empiric*,—a word, the signification of which was originally the same,—has, in modern languages, and in particular in the English, been long in use. By having been confined in its application to the designation of medical practitioners,—and, among medical practitioners, to those who are considered as making experiments on the bodies of patients, without taking for the ground of such their practice, any sufficient stock of scientific information,—thus it has happened, that the word *Empiric*, how proper so ever in its original acceptation, is in any other than that dyslogistic, i. e. condemnatory one,—and in particular in the one here in question,—become unfit for use. Hence came the necessity of having recourse, as here, to the word

This division has for its source the application or non-application of those newly discovered or created properties, which *Art*, in conjunction with *Science*, has had for its fruits, to the purposes of *common life*, through the medium of *commercially established Art* and *Manufacture: Art* and *Manufacture*, established upon such a footing that their produce is become an object of commerce.

Anapirical Anthropurgics has for its synonym the familiar compound appellative *Experimental Philosophy*.

Catastatical, or *Catastatic*, Anthropurgics has for its synonym the expressive, already established, and not altogether unfamiliar, appellative *Technology*.*

This tenth division, it is manifest, is not with reference to the last preceding one, *subordinate*, but *co-ordinate:* the aggregate being in both cases the same; only the *source*, from which the principle of division is derived, different.

It comprehends accordingly, and with equal

---

anapiric:—a word which, no less than *empiric*, has place already in the Greek language.

‡ [Catastatical or *Catastatic*.] From a Greek word, which signifies *established*.

* [*Technology*.] From two Greek words, the first of which signifies *art*. The word *technical—belonging to art*—has long been in the language. The word *Technology* has for many years had place in modern languages, and is come into use even in the *English*, though not so much so as in some of the *continental* languages.

propriety applies itself to, the *mechanical* branch and the *chemical*.

The demand, which in practice, there seemed to be for this division, being considered,—the appellatives which constitute the two branches of it being already in use, a place in this sketch could not be refused to it. True it is that, from the first of these ideal receptacles, as the newly produced fruits of art and science are converted into articles of commerce, individual objects are continually passing into the second: but of the appellations respectively given to the receptacles themselves, the propriety remains unchanged.

Beyond this point in the line of *bifurcate* division, there seems not, at present at least, any adequate use, in carrying on the investigation in this direction. Of the genus *Mechanics*, the species, according to a list more or less approaching to compleatness, will be found ranged in a vertical line in a column of Table I, and so of the genus *Chemistry*.

III. To return to *Pneumatology* or *Pneumatics*.

Division 11. Division of *Pneumatology* into *Alegopathematic* and *Pathematoscopic*.†

---

* [*Alegopathematic*.] From two Greek words: the first of which, as above, signifies *to pass by unnoticed*; the other, *sensation*, *feeling*, or *affection*.

† [*Pathematoscopic*.] From two Greek words, the first of which signifies *sensation* or *feeling*, as above.

Alegopathematic, or say *Alego-æsthetic* Pneumatology has, for its single-worded synonym, the not unexpressive appellation *Noology*.*

It has for its subject *spirit* or *mind*, considered apart from all *feeling*, whether of the pleasurable or painful kind: considered accordingly with reference to the purely intellectual part of the animal frame: including *simple perception*, *memory*, *judgment*, *reasoning*, *abstraction*, *imagination*, &c.

Pathematoscopic Pneumatology may have for its synonym *Pneumatic*, or *Psychological*† *Pathology*.

Division 12. Division of *Pathematoscopic Pneu-*

---

* [*Noology.*] From two Greek words, the first of which signifies *mind*, and in particular the *intellectual* part. Though the word thus compounded has not yet found its way into the body of the language, yet among literary men, and in particular in the universities, the first of its elements *nous* has for many years been in use, though rather in a jocular and purely colloquial, than a serious and regularly established sense. A man is said to have some *nous*—or to be not altogether devoid of *nous*—i. e. *understanding*—*intelligence*.

† [*Psychological.*] From two Greek words: the first of which signifies *the soul of man*: though, probably enough, it began to do so, not till after it had for some time signified a *butterfly*. The word *psychology*, though more in use on the continent than in England, is already in the English dictionaries. *Animula, vagula, blandula*, &c.—"little foolish, flattering thing"—was the celebrated address, made, on his death-bed, to his own soul, by the Emperor Adrian, to whose mind the original signification of the word *psyche* seems, on that occasion, to have presented itself.

matology, or say *Pneumatic* or *Psychological Pathology*,* into *Aplopathematic*† and *Thelematoscopic*.‡

Aplopathematic Pneumatology has for its subject the aggregate of *Pleasures* and *Pains* of all kinds, considered apart from whatsoever influence, in the character of motives, the prospects of them may have upon the *will* or *volitional* faculty,—and the *acts*, as well purely *mental* and *internal*, as *corporeal* and *external*, of which those prospects may become the *causes*.§

---

* [*Pathology.*] From two Greek words, the first of which signifies *feeling* or *sensation*. It has long been in the English language, though not often employed in any other than a *medical* sense: in which case the import of it is seldom extended beyond that of *bodily sensation* or *feeling*, considered with a view to some *disorder* with which it may be supposed to be connected.

† [*Aplo-pathematic.*] From two Greek words: the first of which means *simple*,—relating to the thing in question and nothing else;—the other, *sensation* or *feeling*, as above.

‡ [*Thelematoscopic.*] From two Greek words: the first of which denotes the faculty of the *will*—the *volitional* faculty—as contradistinguished from the *intellectual*. It seems wonderful, that, neither from the Greek, nor from the Latin, a word so continually in demand as the substantive *will* should have any *conjugate* in the shape of an *adjective* belonging to it. The adjective *volitional*, derived by analogy from the substantive *volition*, is not in *Sheridan*'s English Dictionary, nor, probably, in any other: instead of it may be found the word *volitive*, a word which is not at all in use, nor is, by a good deal, so nearly allied in sound.

§ [*Aplopathematic Pathology.*] Either from the genus *Techno-*

logy, or from the genus *Aplopathematic Pathology*, the process of ramification might have been carried on further to an indefinite length. But, on the present occasion,—partly in consideration of the quantity of labour, which, in case of any such formal continuation, would, on the part of the author, have been necessary, partly of the largeness of the draughts which it would have been necessary to make on the patience of the reader,—at this point it has been deemed most advisable to stop.

Beyond this point it seems as yet matter of uncertainty, whether it would be worth while to persevere in proceeding on the *exhaustive* principle.

Of these two branches, *Aplopathematic Pathology*, though in that Systematic Sketch, with its accompanying Table, *that* to which the precedence was found necessary to be allotted, is that which, in respect of its nearer vicinity, and more obvious relation to the common end, a convenience may be seen in bringing to view, on the present occasion, in the first instance.

Under *Aplopathematic Pathology*, the *source* of ramification will be the nature of the *end*, to which the several branches of art and science issuing from it, will respectively and successively be directed: under *Technology*, it will be the nature of the *means* employed for the attainment of that end.

Proceeding from the consideration of the nature of the *end*, the first division might be into *Odynothetic* and *Hedonosceuastic*, or say *Hedonistic—pain-repelling* and *pleasure-producing*.

Widely distant as pain and pleasure are from one another in their extreme degrees, not only in their nearest degrees do they run one into another undistinguishably, but, in instances, to an indefinite extent, by one and the same individual operation, by which the one is excluded—the other is produced. But this is a difficulty which, throughout the whole field, the labours of the logical tactician have to encounter at every step: nor does the nature of things admit of its being either avoided or removed.

Under *Odynothetics*, one obvious source of division is the nature of the *source*, from which, immediately or more or less minutely,

the pain may be found to flow: and here the distinction between the work of unassisted *Nature* and the work of *Man* would again find place.

Considered as being purely the work of *Nature*, Pain will have its immediate source, either *within* the precincts of the body afflicted with it, or *without* those precincts. Considered as having its source *within* the body, it may be referred to *disease*: and, under the name of *Hygiantics*, the branch of art and science, which employs itself in combating that affliction, may, together with those branches, which presented themselves as subservient to this principal one, be seen already held up to view, though without any attempt at systematic order, in Table I.

Considered as having its source *without* the body, pain will be found referable either to the head of *calamity*—purely *physical calamity*—or to that of *delinquency*.

As to the *means immediately* employable for combating pain, considered as having calamity for its source,—these will, of course, be different, according to the nature of the particular calamity, and will accordingly be referable to different branches of art and science. But, in so far as *power—political power*—is, in a less immediate way, employed in causing application to be made of those means, the subject belongs to the ensuing head of *Politics* or *Government*, and there-under to one of the sub-branches of the branch termed *Police*.

In so far as the affliction is considered as having its source in *delinquency*, the art and science to which it belongs is also *Government*, of which in the text.

For the subject of *Hedonistics*, two obvious sources of division present themselves: one is the *seat* of the pleasure in question; the other, the *channel* or *inlet*, through which it is *let in* to the mind.

The *seat* will either be, in virtue of the whole of the nervous system taken together, the whole of the bodily frame, or, in a more particular manner, this or that particular organ, or other part. To the first of these heads belong the means employed to

the opposite purposes of *calefaction* and *refrigeration*: both concurring in confining the quantity of *caloric* diffused through the body within those bounds, within which bodily comfort is among the fruits of it.

To this same head belongs, in the next place, the consideration of the various *instruments*, by the application of which that state of the nervous system which, in its several modifications, may be comprised under the generic term of *intoxication*, is capable of being produced.

To the other of the above two heads may be seen to belong the subjects of *Cookery* and *Confectionary*, *Liquor-making* and *Perfumery*: the term *Liquor-making* being here considered as confined to the designation of potable liquors, other than those applied to the just-mentioned purpose of intoxication.

From the nature of the *inlet*, considered as distinct from the *seat*, may be deduced any such ramifications as may be employed in presenting to view, in the first place, *gymnastic exercises* in general,—exercises productive of a pleasure of which *the whole body* is the *inlet*, as well as the *instrument*: in the next place, such *games of skill*, and even of *chance*, which, no part of the pleasure afforded by them being considered as having its seat in the body, may be considered as exercises productive of a pleasure administered by, and let in through, the body, to the mind.

To the branches of Art and Science, which have for their subject the above exercises, *none* of which have any special inlet, may here be added,—under the description of branches, having, for their subject, pleasures admitted respectively through their several *special inlets*,—those which are commonly designated by the collective name of the *Fine Arts*:—viz. *Music*, having for its sole inlet the *ear*; *Painting* and *Sculpture*, the *eye*; *Poetry*, affording a pleasure which finds its entrance at both those inlets.

In the case of the *Fine Arts*, two perfectly different *species*, affording commonly as decidedly distinct *degrees* of pleasure, may be distinguished: viz. that which is experienced by those, by

whom nothing but the product of the operation is enjoyed, and that which is experienced by him, by whom,—singly, or in conjunction with others,—the operation is performed: the first-mentioned set unlimited in multitude; the other, limited to the fortunately endowed few: the former, mere passive recipients; the other, adding in their persons to the character of passive recipients, that of active and productive instruments.

Under the name of *Somatico-Hedonistics* might be collected and comprehended, those branches of art and science which, as above, have for their objects those modifications of pleasure, which have the *body* for their seat; under the name of *Pneumatico-Hedonistics*, such as have for their objects those more refined classes of pleasures which, passing through one or more of the inlets afforded by the body, find their ultimate seat in the mind.

For *Technology*, the first division might be that which has for its source, the distinction between such instruments as are applied *immediately* to one or other, or both together, of the two all-comprehensive objects above-mentioned,—viz. exemption from pain, and perception of pleasure,—and such as are conducive to the production of those same desirable effects, no otherwise than in a manner more or less *remote*, viz. by being, in some way or other, conducive to the production of the just-mentioned immediate instruments. Of the branches thus elicited, the field upon the face of this account of it, appears to be nearly, if not altogether co-extensive and coincident, with that of *Aplopathematic Pathology*,—considered in its two branches, viz. the *Odynothetic* and the *Hedonistic*, as above-mentioned.

Materials and *instruments*—materials on which the art is exercised, and instruments with the help of which it is exercised—in the distinction between the extensive and multifarious classes of objects, thus respectively denominated, another source of division may be observed.

In respect of *vicinity to use*, the station of the *materials*, serving as subjects to the art, is susceptible of indefinitely numerous

degrees. The *extreme* stations are those respectively expressed by the appellatives *raw materials* and *finished work*. Between these two extremes may be seen interposed, according to the nature of the finished work, different numbers of distinguishable *intermediate* states. As the number of these intermediate states *increases*, the *finished work* being the same, the total mass of labour, employed in the production of the finished work, has been observed to be *diminished;* diminished by the influence of causes, which, under the head of *division of labour*, have been so clearly held up to view by *Adam Smith*.

When, considered under all the modifications of which it is susceptible, the *work* has been brought into that state in which the appellation of *finished work* may with propriety be applied to it,—on taking any article of it for an example, it will be found to be either of such nature as enables it, without the intervention of any other object, to be applied in an immediate way to *immediate use*,—viz. in the way either of excluding pain or of administering pleasure, as above,—or else not to be susceptible of being applied to use in any other shape than that of *preparatory, subservient*, or say *instrumental* use, viz. by being subservient to the production, or right and effective application, of some subject or subjects, applicable, as above, in an *immediate* way to use.

As there are instruments, the use of which consists in their being respectively applied in an *immediate* way,—that is, each according to its nature and destination, applied without the intervention of any other, to the repulsion of pain, or production of pleasure, or to both at once,—so there are others which, howsoever truly conducive to these ends, are not so in any other than an *unimmediate* way, i. e. by being subservient either to the production, or to the application of some instrument or instruments, coming, as above, under the denomination of immediate instruments. *Immediate* utility admits not of *degrees:* but of *unimmediate* utility, as above, degrees may have place in any number. The *scale*, to which these degrees belong, may be

termed the scale of *vicinity to use.* Instruments, the station of which is on the highest degree of the scale—say the *first* degree—the degree nearest to immediate use—may be termed instruments of the 1*st order:* those, next to them, i. e. next below them, instruments of the 2*d order;* and so on, through any number of degrees, which, in any system of connected instruments, may, at any time, be found exemplified.

Of materials, and instruments of all kinds, whether applied immediately or unimmediately to use—some are applicable, and accordingly applied to their respective uses, each of them by itself: others, not but in conjunction, each of them with one or more other instruments.

Agriculture is conspicuous for the number of instances it affords of instruments which are capable of being, and are wont to be, employed *single,* as above: Manufactures, taken in the aggregate, for the multitude of the instances they afford, of instruments which cannot be employed but conjunctly.

The principal characteristics, by which the systems of productive operations, commonly comprehended under the appellation of *manufactures,* are distinguished from those called *trades,* or *handicraft trades,* seem to be—the greater length to which they carry the division of labour,—the multitude of the instances they afford of instruments of *subservient use,* employed *conjunctly* with each other,—and the number of the different *orders* into which, as above, those instruments would be found ranged below one another in the scale of *vicinity to use.*

Raw material, or *finished work*—instrument of *immediate* use, or instrument of *unimmediate* and *subservient* use—no portion of matter can ever, or in any way be of use, until it is arrived at the *place,* which it is requisite it should occupy, in order to its being applied in that same way to use. Hence two universally concomitant modes of subserviency to use, of which, in so far as they are moveable, all useful instruments are susceptible: viz.

Thelomatoscopic Pneumatology, or *Pathology*, has for a synonym the single-worded appellative *Ethics*,* taken in its largest sense.

In the character of synonyms to Ethics are also used, in some circumstances, the words *Morals* and *Morality*.

Division 12. Division of *Nooscopics* or *Noology*

---

subserviency in the way of *formation* or *application*,—and subserviency in the way of *conveyance*.

To this place belongs a system of division, which, with a view to clear, correct, and all-comprehensive conception, might not altogether without advantage, in the way of instruction, be applied to the aggregate mass of the several different *instruments of conveyance*: these are (say) *stationary*, i. e. Roads; *moveable*, i. e. *Carriages*,—and so on.

In the above may be seen, though nothing like a complete list, a specimen of the various *sources of division*, by means of which, taken altogether, roads might, with no small instruction and convenience, at any rate, to the as yet unpracticed traveller, be cut in so many various directions, through the wilderness of *Technology*.

A view of what was done in this way, by an ingenious philosopher of the 17th century, viz. *Bishop Wilkins*, though in prosecution of a design different from the present one,—*his* being no less than that of substituting, throughout the whole field of language, an entire new language to all those at present in use,—is intended for a separate article in this Appendix: it contains so much of that great work as seemed to bear relation to Technology.

* [*Ethics.*] From a Greek word, which signifies *manner* or *manners*: manner of *conducting* one's self in the course of life.

into *Plasioscopic** and *Coenonesioscopic*:†—*Plasioscopic*, i. e. *Formation—regarding*; *Coenonesioscopic*, i. e. *Communication—regarding*.

To the head of *Plasioscopic* Noology may be referred the *art of thinking*, with the correspondent science of what belongs to the formation of the matter of thought, in so far as the work of *formation* can be kept in view, and carried on in a state of separation from the work of *communication*, as applied to the same individual portion of that ideal species of matter.

To the word *Logic*, considered as the name of a branch of art and science, the conception that has been attached, seems never to have been altogether so determinate and definite as could be wished. But in *one* at least of the senses, in which it has been employed, it may be considered as the single-worded synonym of *Plasioscopic Noology*, as above characterized.

Division 13. Division of *Coenonesioscopic Noology*, or say *Coenonesiology*, into *Aplo-didactic*, or say *Didactic*, and *Pathemategeretic*, or say *Egeretic*. *Aplo-didactic*, i. e. *simply information affording*; having, for the end or object of the communication in question, *that* and nothing more: *Pathe-*

---

* [*Plasioscopic.*] From two Greek words, the first of which signifies *formation*.

† [*Coenonesioscopic.*] From two Greek words, the first of which signifies *communication*.

mategeretic or *Egeretic*; i. e. *Affection-exciting*, or in one word *excitative*.

Of the word *Grammar*, if not exactly co-extensive with, the import will (it is believed) be recognized as comprehended under, the import of the word *Aplo-didactic*, as above explained.

To the head of *Grammar* seem commonly to be referred those rules, and no others, which have for their subject, among the words employed for the communication of thought, such relations between word and word as are still the same, whatsoever may be the particular *purpose* and *occasion* of the communication, and the *nature* and *subject* of the thoughts communicated.

To the head of *Rhetoric* seem commonly to have been referred those rules, which have for their subject the choice capable of being made of words and combinations of words, on occasions on which the communication made, has for its purpose, or in the number of its purposes, the exercising an influence on the *Affections*; on the Affections, whether considered as having place in a *calm* state, or as in that state of *intensity* and *perturbation*, in which they receive the name of *Passions*.*

---

* Words, and assemblages of words, considered as applied or applicable to this purpose, are, in the institutional books, styled books of Rhetoric, designated by the collective name of *Figures of Speech*: but, on the list of these Figures of Speech, as designated by their respective names, several may be seen, that apply more decidedly to the *imagination* than to the *affections*: as well

as others, which, without addressing themselves to either of these two classes of psychological fictitious entities, are considered as capable of being subservient to the communication of thought, by means of *collateral* associations: i. e. by means of *accessory* ideas, which stand associated with the principal idea—with the idea, of which the word in question is directly and professedly significative, and which it was in the first instance employed to bring to view.

Works of this description,—the study of which is commonly, in schools, an immediate sequel to that of the rules of *grammar*,—are what the author of *Hudibras* appears to have had in view, where he says,—

> " For all a rhetorician's rules
> " Teach but the naming of his tools."

This portion of stock,—marshalled as have been the contents of it by the didactic verse-maker, rather than by the Logician,—remains as yet, it is believed, in that original chaotic state in which, without particular examination, it seems scarcely practicable to bestow upon it any denomination, more characteristic than that of *Figures of speech*, by which it has hitherto been designated.

Between the imports, which, by even the most ancient Greek writers extant, was annexed, and from them continues to be annexed, to the words *Grammar* and *Rhetoric* respectively, the relation, which may be seen to have place, is very different from that which can not but have originally had place, if not between the words themselves, between those from which they were respectively derived. By the word *Rhetoric*,—derived from the verb ῥέω, to flow in a stream, which in some of its *conjugates*, though not in all, (for in this secondary sense the assemblage is far from complete) was employed to designate the particular kind of *efflux*, distinguished by the name of *speech*,—the *audible* signs of language, and none but the audible signs, were denoted:

by the word *Grammar*, derived from γραφω,—to make *visible* or *tangible* marks,—none but the visible or tangible ones.

Thus far,—to judge from the undubitable etymologies of the two words,—*Rhetoric* should have been the name, which, in the earliest stage of society,—viz. antecedently to the invention of the visible and tangible class of signs,—was employed to designate the thought-communicating art, viz. taken in the whole of its then extent, and to what purpose soever it was considered as applied or applicable. So, in like manner, from and after the introduction of those visible and tangible signs, *Grammar* should have been applied to the same field, taken in the same unlimited extent, so as in its import to differ from *Rhetoric* on no other point, than that of the different species of *signs*, respectively employed by the two arts.

Of the change which, upon the face of this statement, appears to have taken place between those original, and the subsequently established and still existing imports, absolute and relative, of the two words, the cause seems to be this:—Antecedent to the time at which the use of *letters* was invented in, or imported into, the cluster of nations, whose language was the Greek language,—the operation of speaking to a numerous audience, on subjects of a complicated nature, and thence in discourses which continued *flowing on* as it were, to a considerable length, had in consequence of the form taken by the political constitution of some of these nations, grown into use. Ρητωρ (*Rhetor*) the man of *fluency*, was accordingly the appellation by which a man, considered as engaged in operations of this description, came to be designated.

But, on the occasion of an address, delivered on such subjects, and to such audiences, motives for exercising on the *affections*, and even on the *passions*,—whether directly, or through the medium and with the assistance of the *imagination*,—whatsoever influence a man was able to exercise, could never be wanting. And thus it was, that *Rhetoric*—the language of the *Rhetor*—i. e.

the *Public Speaker*, came to signify—not so much speech at large, as speech considered as addressing itself, either directly or through the medium of the *imagination*, to the *affections* and the *passions*.

When,—the art exercised by the public speaker having, for a length of time more or less considerable, been already in use,—the signs, invented for the purpose of giving permanence to the import expressed by those audible and evanescent signs, had also, for a length of time more or less considerable, been in use,—then, and not till then, it was, that those relations, for the designation of which the collective appellation *parts of speech* came to be employed, could for the first time have presented themselves to view.

To obtain, over the vast aggregate, composed of the whole assemblage of the words, of which the language used by the nation in question was composed, such a command, as enabled a man to marshal them all in his mind, and lodge them, every one of them in one or other of the eight or ten classes, having for their collective denomination the many-worded appellative *parts of speech*, were an enterprize, such as could scarcely have been projected, much less executed, without the benefit of that assemblage of permanent and everlasting signs, which, in every combination they are susceptible of, are capable of being kept in a steady position during any required length of time, under the corporeal, and thence under the mental eye.

And, in the progress of the art of *Education*, thus it was, that to instruction in the art of perceiving the import, and tracing the forms, of these visible and tangible *characters*, came by degrees to be added instruction in the nature of those *relations*, between their respective imports, in contemplation of which the whole body of the words, of which a language is composed, is divided and distributed among the parts of speech.

In the institutional works on this subject,—derived by us, whether immediately, or through the medium of the Latins, from the Greeks,—a division made of Grammar is into *Orthoëpy* and *Ortho-*

graphy:—*Orthoëpy*, the art of performing the operation of speaking—in the *right*, i. e. in the *customary* mode: *Orthography*, the art of performing the operation of *writing* in the correspondently right mode.

Considered merely as *operations*, first of the two, as above, came *speech*, then, and not till after an interval of indefinite and unmeasurable length, *writing*. But considered as *arts*, to the exercise of which *aberration* from a standard, and thence *rectitude* (the absence of aberration) were incident, first must have come (if the above observations be well grounded) *Orthography*—the art of *writing*—and not till after *that*, the art of *speaking* correctly, viz. according to the *usages* to which expression had been given, in and by the rules of *Grammar*.

The word *Rhetoric* having thus two considerably different significations,—the one, original and unbounded,—the other, derivative, comparatively modern, and comparatively narrow,—the one, designating the operation of speech, taken in its whole extent,—the other, the art of speech considered no otherwise than as applied to the particular purpose, of exercising, *occasionally*, through the medium of the *imagination*, influence over the *affections* and the *passions*,—no wonder if, in works having for their subject the import of this word, the line drawn between these two connected significations should be found not altogether clear and uniform: in this or that work taken singly, not clear: in such or such two works compared together, not the same.

How narrow the conception is, which, by the word *rhetoric* has been presented to the authors of the small institutional books above alluded to,—may be seen, by means of a glance bestowed on the string of definitions and examples, of which the books so intituled are composed,—and scarcely by any other means. In any one of *these* books may be seen the import of this appellation taken at its *minimum*. The *maximum* may be seen in the definition given of it, in one of the most instructive as well as most recent books on the subject—viz. *The Philosophy of Rhetoric*, by the late *Dr. Campbell*, of *Aberdeen*. In the first page of the body of

the work,—after having, without notice given of the change, or of the relation between the import of the two words, substituted *eloquence* to *rhetoric*,—"The word *eloquence*, taken in its greatest "latitude, denotes" (he says) "that art or talent by which the "discourse is adapted to its end. All the ends of speaking" (continues he) "are reducible to four; every speech being in- "tended to enlighten the understanding, to please the imagina- "tion, to move the passions, or to influence the will." Thereupon, not adverting to the practice of *writing*,—whether for the writer's own use, or for the use of others, whether particular individuals or the public at large,—he immediately uses not only the word *speech*, but the word *speaking*, as co-extensive with and synonymous to the word *discourse*. In a Note, "the word *eloquence* (says he) "in common conversation is seldom used in such a com- "prehensive sense." For "the choice" made "of this definition," he thereupon gives two reasons: the second too long to be noticed here; the first is, that "it exactly corresponds with Tully's "idea of a perfect orator," which he thereupon quotes. But in this the Christian Divine does the Heathen Philosopher much more, and himself much less than justice: for of his last-mentioned *end*, viz. influencing *the will*,—in comparison of which those mentioned by Tully are, all of them, but as *means*,—the passage from Tully says nothing.

In regard to Grammar, the case is—that, of the field of language, considered without reference to the particular nature, of the subject, purpose, or occasion on which it is employed,—and in *that* sense, in a purely *grammatical* point of view, the consideration of what belongs to the mutual relations correspondent to the different parts of speech, does not cover the whole expanse. In this part of the field, what is wanted for use—for general use—is a work, the object of which shall be to shew the course best adapted to the purpose of rendering language,—i. e. the particular language employed, whatsoever it be,—in the highest practicable degree, well adapted to the *general* end or purpose of language, viz. *communication of thought*, abstraction made of the

Division 13. First Division of *Ethics* (taken in the largest sense of the word) viz. into *Dicastic*,* i. e. *Censorial*, and simply *Exegetic*,† i. e. *Expository*, or *Enunciative*. *Dicastic*, or *Censorial*, i. e. expressive of a judgment or sentiment of approbation or disapprobation, as intended by the author of the discourse, to be attached to the ideas of the several *voluntary actions*, (or say *modifications of human conduct*), which, in the course of it, are brought to view: in other words—his opinion, in relation to each such art, on the question—whether it *ought* to be done, ought to be left undone, or may, without impropriety, be done or left undone.

Simply *Exegetic*, i. e. *Expository* or *Enunciative*, viz. in so far as, without bestowing any such mark

---

particular nature of the particular *purpose*, to which, on the particular *occasion* in question, it may happen to it to be employed. By the observation of the rules, called *rules of grammar*, belonging to the particular language in question, true it is, *that* general purpose will in some measure be accomplished. But to afford a complete direction for the complete accomplishment of it, will, it is believed, be found to require, in addition to those at present designated by the appellation of *grammatical rules*, others, in considerable numbers, extent, and variety, which have not as yet been brought to view. To attempt something in this way has been among the designs comprehended in the present work.

* [*Dicastic.*] From a Greek word, which signifies *to determine, in the character of a judge.*

† [*Exegetic.*] From a Greek word, which signifies *to set forth in the way of discourse.*

of approbation, disapprobation, or indifference, the discourse has for its object the stating what, in the opinion of the author, has, on each such occasion, actually come to pass, or is likely to have come to pass, or to have place at present, or to be about to come to pass in future,—i. e. what act is, on the occasion in question, most likely to have been done, to be doing, or to be about to be done.

This division has for its source the nature of the *mental faculty*, to which the discourse is immediately addressed. In so far as the discourse is of the *Censorial* cast, the faculty to which it addresses itself, and which, in so doing, it seeks to influence, is the *volitional*—the *will*, or at any rate the *pathematic*. In so far as it is of the simply *Expository*, or *Enunciative*, cast, the only faculty to which it immediately applies itself, viz. by seeking to afford *information* to it, is the *intellectual* faculty—the *understanding*.

For a synonym, *Dicastic Ethics* may have the single-worded appellative *Deontology*.*

---

* [*Deontology.*] From two Greek words, the first of which signifies *fit, fitting, right, becoming, proper.* Deontology—an account or indication of that which, on the occasion in question, whatsoever it be, is—(i. e. by him who speaks or writes, is regarded as being)—*fit, fitting, becoming, proper.* It is in *sound* only, and not in *signification*, that it has any connexion with the word *outology*, employed above.

Applied to every branch of Ethics, taken in the largest sense of the word *Ethics*, the use of such a word as *Deontology* affords

The principle of division, deduced from this source, will be seen to be applicable, and accordingly applying itself, severally to all the following ones.

Division 14. Division of *Ethics* (whether *Expository* or *Dicastic)* into *Genicoscopic,** i. e. *general matters-regarding*; and Idioscopic,† i. e. particular-matters-regarding.

Synonyms to *Genicoscopic*, as applied to Ethics, are, 1. *Theoretical*; 2. *Speculative*. Synonyms to Idioscopic, as applied to Ethics, is the word *practical*.

In this, as commonly in other cases, the limits between *general* and *particular* not being determinate, so neither are those between what, on the one hand, is *theoretical* or *speculative*,—on the other, *practical*. Of the observations expressed, such part as is allotted to the explanation and fixation of the import of *general words*,—words of extensive import, the use of each of which is spread over

---

a promise of being attended with considerable convenience. It will accord equally well with every system which ever has been, or ever can be, devised, in relation to the foundation of moral obligation:—in the use of it, no such incongruity and presumption is involved, as that which is called *petitio principii*—i. e. a begging of the question—an assumption of the matter in dispute.

* [*Genicoscopic.*] From two Greek words, the first signifying *general*.

† [*Idioscopic.*] From two Greek words, the first signifying *particular*.

the whole field, or a large portion of the whole field, of the art and science,—will belong mostly to the *genicoscopic*, *theoretical*, or *speculative* branch: and, under the name of *principles*, to the above observations will naturally be added any such *rules*, whether of the expository or the censorial cast, as in this respect are most extensive.

The deeper it descends into particulars, the more plainly it will be seen to belong to the *idioscopic*. In so far as, with the incidents exhibited in the fictitious narrative, any rules of a *deontological* nature (as in modern productions is frequently the case) happen to be intermixed, the matter of *novels* and *romances* comes to be included in, and the immense mass of it forms but a part of, the matter of PRACTICAL ETHICS.

Division 15. Division of Ethics,—whether Exegetic or Dicastic, and whether Genicoscopic or Idioscopic,—into *Apolioscopic** i. e. *political-state-not-regarding*, viz. PRIVATE ETHICS—*Ethics* in the more usual sense of the word,—and *Polioscopic* i. e. *political-state-regarding*,† viz. GOVERNMENT,‡ alias POLITICS.§

---

* [*Apolioscopic.*] From three Greek words: the first of which is the sign of negation; the second signifies a political state, and the third *regarding*.

† [*Polioscopic.*] From two Greek words, as above.

‡ [*Government.*] § [*Politics.*] By the word *Government*, the *practice*, and thence the *art*, seems to be more especially signified: by the word *Politics*, the corresponding branch of *science*.

A commodious

Division 16. Division of *Politics* and *Government* into *Esoscopic*,* i. e. *internal* or *interior-concerns*-regarding, viz. INTERNAL GOVERNMENT, —and *Exoscopic*,† i. e. *external-concerns-regarding*,—viz. INTER-NATIONAL GOVERNMENT and POLITICS.

By *Internal* Politics, may be understood that branch of *Ethics* which has for its subject the conduct of *Government*, i. e. of the *ruling* members of the *political community* or state in question, as to-

---

A commodious division of Private Ethics might be into *esoscopic* and *exoscopic*, i. e. *within-regarding*—(or say *self-regarding*)—and *extra-regarding*,—what it is right for a man to do, in so far as his own is the sole interest in question, and what it becomes right for him to do, when the interests of other sensitive beings are taken into the account.

* [*Esoscopic.*] From two Greek words, the first of which signifies *within* or *inwards*:—looking inwards,—viz. to the welfare of that individual alone, by whom, on the occasion in question, the subject in question—viz. his own conduct—is looked into.

† [*Exoscopic.*] From two Greek words: the first of which signifies *outwards*:—looking outwards, i. e. to the welfare of some person or persons, other than the one whose conduct is in question, as above.

Two words from the same roots, viz. *esoteric* and *exoteric*, are already in the language: they are, however, but little in use, being terms of technical divinity, applied to the case where the same discourse is supposed to have had, in the intention of him whose discourse it was, two different meanings: one, in which it was designed that it should be understood by one person or set of persons; another, in which it was designed it should be understood by another.

wards the *whole* number of the members of that *same* community: by *Inter-national Politics*, that branch of *Ethics*, which has for its subject the conduct of Government, as above, as towards the members, whether rulers or subjects, of *other* such communities.

Division 17. Division of *Internal Government* and *Politics* into *Nomothetic*, i. e. *legislative*.—viz. LEGISLATION and *Aneunomothetic*, i. e. *without legislation*,—viz. ADMINISTRATION.

In so far as it is by the establishing of laws that the business of government is carried on, it is carried on in the way of *legislation*:* in so far as it is

---

* A law is a discourse,—conceived mostly in *general*, and always in *determinate*, words,—expressive of the *will* of some person or persons, to whom, on the occasion, and in relation to the subject in question, whether by habit or express engagement, the members of the community to which it is addressed are disposed to pay obedience.

This is the only plain and proper sense of the word: in this sense the object of which it is designative is a *real entity*. In every other sense, it is figurative and improper: the object of which it is designative is a mere *fictitious entity*: and every discourse, in which the reality of it is assumed, delusory.

Mostly in general words—loose is the expression: but the looseness was unavoidable. Of the mode and degree of *generality*, necessary to distinguish *a law* from *an order of administration*, no description is to be found any where; and any description on the subject would here be out of place.

Scarcely, perhaps, will the few lines that follow find excuse.

Of the hands, by which political *power*—whether of the *administrative* or the *legislative* cast—is exercised, the situation may

carried on otherwise than by the establishing of laws, it is carried on in the way of *Administration.*

Division 18. Division of *Administration* into *Aneristic,** i. e. *Uncontentious*, viz. ADMINISTRATION

---

be either *supreme* or *subordinate.* In common speech, however,—so indistinct are the conceptions commonly entertained, and the language commonly held, in this part of the field of thought and action,—the terms *legislation* and *legislators* are wont to be regarded and employed, as if applicable in no other case than that in which the situation of the hands, by which the power is exercised, is *supreme.* Accordingly, and in consequence, in the case where it is regarded as being subordinate, the discourses, in and by which their will stands expressed, are, by a confusion of terms, wont to be spoken of, as being the result of the exercise —not of *legislative* but of *administrative* power: as *acts*—not of *legislation* but *administration.*

Between such discourses, as are regarded as being the results or products of the exercise of *legislative* power, and such as are not regarded in that light (the *will* expressed being, in both instances, regarded as the will of a person or persons, possessing in that behalf competent authority) the line of separation remains, even to this day, altogether unsettled and indeterminate. Among the terms, employed in the designation of the various objects, whether *persons* or *things*, to which the discourse makes reference, the greater the proportion of those, which, in contradistinction to the *individual*, are of the *generic*, cast,—being names of *sorts* of persons or things, and not merely of *individual* persons or things, the more likely,—the less that proportion, the less likely the discourse is, to be regarded as a result of the exercise of *legislative* power.

* [*Aneristic.*] From two Greek words: one of which is a sign of *negation*; the other signifies *contention* or *of contention.*

The *science* corresponding to the *art* of judicature is termed

in the more common import of the term,—and *Eristic*, i. e. *Contentious*—viz. JUDICATURE.

Division 19. Division of Judicature into *Autothetic*,* i. e. *self-established*, viz. Judication, according to COMMON, *alias* UNWRITTEN, LAW, and *Catanomothetic*,† i. e. according to Legislation, viz. Judicature, according to STATUTE, *alias* WRITTEN LAW.

§ IX. *Explanations, relative to the above Sketch and Table.*

In the sketch thus attempted, the following particulars present themselves as having, in a greater or less degree, a claim to notice.—Subjoined to them, respectively, are a few *questions*, in relation to which some satisfaction may not improbably, it is supposed, be looked for, and will accordingly be here endeavoured to be afforded:—

JURISPRUDENCE. But this is not the only sense in which the word Jurisprudence is employed. In France and in French it has been used to designate what, in English, is called *Common*, or *Unwritten, Law*, in contradistinction to *Statute*, or *Written*, Law. Witness *Jurisprudence des Arrêts*.

* [*Autothetic.*] From two Greek words: the first of which signifies *self;* the second, *established*.

† [*Catanomothetic.*] From three Greek words: the first of which signifies *according to;* the second, *law*, or *by law;* the third, *established*.

1. In the Tabular Diagram, and accordingly in the Explanation given of it, the *division* or *ramification* professes all along to be *exhaustive*.—*Question* 1. What are the uses or advantages derivable from a *tabular* sketch, exhibiting in one view a number, more or less considerable, of the branches of art and science? *Answer*. See § 10.—*Question* 2. Why *branches of Art and Science*, and not *Arts and Sciences? Answer*.—Because, in every part of the field, *Art* and *Science* are found together: no branch of art without a correspondent branch of science—no branch of science without a correspondent branch of art. It is not that in one part of the field you have an art, in another a science, in a third both, but that in whatever part you have either, you have both. See Chrestomathia, Table I. Note (9). *Question* 3. Why *exhaustive?* What are the uses and advantages resulting from its being so?—*Answer*. See § 11. *Question* 4. Can it, by any and what means, be proved to be so? *Answer*. See § 12. *Question* 5. The idea of the *utility* of exhaustiveness, as applied to logical division—is it new to the *scientific*, and in particular to the *logical* world? *Answer*. Far from new; but at the same time not as yet quite so clear as it might be, and it is hoped will here be rendered. See § 13. *Question* 6. Can any directions be given, by the pursuance of which, the exhaustiveness of a systematic sketch, of the subdivisions and contents,

of any branch of art and science may be secured? *Answer.* See § 12.

2. The ramification is all along *dichotomous*, alias *bifurcate*, i. e. two-pronged. *Question* 1. Why *bifurcate* rather than *multifurcate?* *Answer.* To secure its being exhaustive; concerning which, see § 12. *Question* 2. Is the idea of the necessity of bifurcation to exhaustiveness new, as above? *Answer.* So it is supposed to be. See § 13.

3. Of the first partition of this kind that occurs, the result is composed of *two*, and no more than two, branches of art and science, which are thereby represented as included in that *one*, the division of which has thus been made; and as containing between them the whole contents of it. And so in the case of any other.

4. Of those two condivident branches, the names are respectively formed by, and composed of, the name of the *immediate* trunk,—which, grammatically speaking, is a *noun-substantive*,—followed, in each of the two instances, by a *noun-adjective*. *Question* 1. Of this two-worded name what is the use? *Answer.* To afford a *definition*, and, by means of the definition, an *explanation*, of the name constituting the immediate trunk.

5. Being thus composed of two words put together, each such name may, in *Greek-sprung* language, be termed a *poly-epic*, and in particular a *biepic*, name; in *English-sprung language*, a *many-worded*, and in particular a *two-worded* name.

6. In every instance, for reasons that have already been brought to view, (§ 6) this two-worded name is, in the first instance, a *Greek-sprung*, and in most instances a newly-framed denomination. *Question.* Why *Greek-sprung*? *Answer.* See above, § 6.

7. In several instances, in the character of *synonyms*, subjoined to this principal biepic and Greek-sprung name, are other such names, one or more in each division; for which see the *Notes*. *Question.* Why these synonyms? *Answer.* 1. That, in each such group of names, the identity of import between the several names may be established; and in so far *that* error prevented, which would have place, if, from diversity in the sign, diversity in the object meant to be brought to view were inferred. 2. That by each of these names the object may in future be made known—not by that name only, but by any one or more of the others:—so that, on each occasion, *that* one of them may be employed, which, with reference to that same occasion, appears most convenient.

8. In most instances, to those *Greek-sprung* two-worded names, are added one or more two-worded, or many-worded, *English-sprung* names. *Question.* Why these names? *Answer.* To make known the import to such readers of English, to whom the import of the Greek-sprung names, new as they mostly are,—especially to English readers,—would not explain itself. By the unavoidable awkwardness

of these compound English names, will be afforded the only justification that could be afforded for the practice of employing any such names, as, being borrowed from a foreign language—and *that* a dead one—are, until explanations of them have respectively been given and received, not intelligible to any but the comparatively small number, of those by whom the import of the corresponding foreign words happens to be understood.

9. Also, in several instances, new-coined, *monoepic*, or *single-worded Greek-sprung*, names. *Question* 1. To what purpose are they thus added? *Answer.* To shew by what means, in these several instances, the facility, afforded by the use of single-worded appellatives, may be substituted to the entanglement and embarrassment produced by the use of many-worded ones.

10. Also, in several instances, appellatives already in familiar use. *Question* 1. For what purpose are these added? *Answer.* For the purpose of contributing to the fixation of the import of these most familiar terms, viz. by presenting the clearest and most correct conception that can be afforded, of the mutual *relations* of the objects respectively designated by them,—and thus giving the greatest extent that can be given, to whatsoever benefits may be derivable, from the use of a Table constructed in this mode.

11. The first single-worded names that occur, viz. *Eudæmonics* and its associate *Ontology*—(both

of them Greek-sprung)—are so many names of that trunk which, with reference to the several pairs of branches,—products of successive acts of partition or ramification,—may be styled the *universal* trunk:—*Eudæmonics*, the universal trunk of *Arts*; *Outology*, of *Sciences*.

12. With reference to the two branches into which it is divided, the name of every branch of art and science, which here presents itself, may, as above, be termed the name of the *immediate* trunk. Every such *immediate* trunk may, with reference to the *universal* trunk, be styled a *particular* or *partial* trunk.*

13. Any number of trunks, intervening between the universal trunk and the partial trunk in question, may, with reference to these two trunks, be styled *intermediate trunks*.

14. The trunk, which stands next to the universal trunk, may be styled the partial trunk of the *first rank* or *order*: that which stands next to it, the partial trunk of the *second* rank or order: and so on.

15. In some instances, several partial trunks are of *the same* rank or order.—This is the case, as often as, from different *sources*, the same trunk is successively subjected to so many different divisive

---

* Thus, in Botany, within an *universal* umbel, are, in the instance of many plants, included a number of umbels, termed on that account *partial* umbels.

operations. In this case, whatsoever be the number of these operations, the divisions performed by them may, in every instance, be equally exhaustive. Be the numbers of *sets* of branches (viz. in so far as the bifurcate mode is conformed to, *pairs* of branches), ever so numerous, the operations themselves, and the pairs of branches, which are respectively their results, are all, with reference to each other, *co-ordinate:* with reference to the results of a division, performed on any trunk of a higher rank, (the highest rank being expressed by the smallest number) *subordinate:* with reference to the results, of a division performed on a trunk of a lower rank, *superordinate.*

16. The relation which, by the *lesser* aggregate designated by the name attached to any such subordinate trunk, is borne to the *greater* aggregate designated by the name attached to its immediate superordinate, is the same as that which, in the language of the current logic, a *species* bears to its next immediate *genus*—the genus of which it is the immediate species. The trunk, here styled *the universal trunk*, corresponds to the *genus generalissimum* of logicians.

17. Contrarily to the usage, which seems chiefly, if not exclusively, prevalent,—for giving intimation of the relation which, in each instance, is represented as having place between the *trunk* and its two *immediate* branches, the word *is*—instead of

being omitted, and left to be supplied by the reader, is inserted.*

Question 1. Why thus depart from the most usual, it being also the most simple, mode?

Answer 1. To exclude *obscurity:* unless the sign of this instrument of connexion is brought to view, no meaning is fully and adequately expressed:—unless the import of it is present to the mind, no meaning is comprehended. True it is, that, to the mind of one, to whom Tables of this kind are to a certain degree familiar, the import of this necessary bond of connexion *may*, at the first glance, and at the same instant, have been presented by those words of the proposition, which are inserted: and thus far no obscurity has place. But, other minds there may be, by which, though through the above-mentioned means, this same conception, will,

---

* The word *is*—parcel of the aggregate of intimately related words, framing, altogether, what, by grammarians, is called *a verb*, viz. the verb *substantive*—the verb by which *existence* and nothing else is indicated—(*a* verb—as if the different sorts of words of which it is composed, were, all of them put together, no more but one) is by *logicians* styled the *copula:* i.e. the instrument of connexion, of which, in the operation, styled by logicians *predication*, the import is always either expressed or understood. By it, unless where the sign of negation is added to it, existence is, in every instance, attributed to some one object, and, in most instances, *identity*, coincidence, or connexion, to two objects with which it is associated.

sooner or later, have been obtained by them, yet for some time it will *not* have been obtained: and, till it is obtained, the undesirable quality of *obscurity* remains in the *object*, and the unpleasant sense of *fruitless labour* in the *mind* to which the object is presented.

Answer 2. To exclude *ambiguity*.—By the sort of omission here in question, it may be, that, in the individual sketch in question, framed as it is here framed, the imperfection thus denominated would not have been found produced. But, in a Table, framed in the manner, in which, to say the least, most Tables constructed for the sort of purpose here in question have been framed, the imperfection would, it is believed, be apt to have place. Two cases may be mentioned, in either of which it has place: 1. In so far as, between any two nouns that have place in the Table, a doubt arises, what is the *copula* intended, viz. whether the *simple* copula—the verb *substantive*—or this or that *complex* copula, that is, any verb, other than the verb substantive.* 2. In so far as, this simple copula being the one fixed upon, so it is that of the nouns,

* In addition to the import of the *copula*, i. e. of the mere sign of *existence*, by every verb other than the verb substantive, the import of the name of mere quality or other, either in the character of a permanent, or in that of a momentary one, may, it is believed, be found presented to the mind:—and this, over and above any of those *accessory* imports, which are denoted by the grammatical terms, *mood*, *tense*, *person*, and *number*.

for the connexion of which it is capable of serving, the number is greater than *two*, a doubt arises for the connexion of what two or more it was intended to serve.

In the Table of *D'Alembert*, these doubts—one of them at least, if not both—will frequently, it is believed, be found presenting themselves.

Answer 3. To exclude *misconception*.—As often as of two conceptions, by the simultaneous existence of which ambiguity is presented, one alone is that which was intended by him whose discourse, the discourse is, here the ambiguity has two *issues* or modes of termination, either of them capable of taking place. In so far as that which happens to be embraced by the reader, is different from that which was intended by the writer, misconception is the result.

17. For presenting to view so many different classes of the words of which the Table in question is composed, so many different *types* are, it may be observed, employed:—viz. 1. for the designation of the *Greek-sprung* words, which, in conjunction with the name of the *immediate trunk*, constitute respectively the two-worded names of its immediate branches, *Italics*, and these in a comparatively large type, are employed.

18.—2. For the familiar English words, which, when strung together in the form of one composite word, form those appellatives which, to the English reader, are designed to afford an explanation of

the, in most instances, new, and, in every instance, *Greek-sprung* epithet,—the common Roman types, and in a comparatively small size, are employed.

19.—3. For the words, which form respectively those single-worded appellatives, which, being of Greek origin, and for the most part new, have on the present occasion been framed for the present purpose,—the sort of type called *black-letter* is employed.

20.—4. For those words, which, being respectively names of so many branches of art and science, are already in the English language, and in familiar use,—for these appellatives, whether single-worded or two-worded,—capital letters are employed.

21. As the trunks, which they respectively designate, recede further and further from the universal trunk, the types employed for these capitals are smaller and smaller.

Questions respecting Articles 17 *to* 21.

Question 1. Why, for the different classes of words, employ types of different *species*?—*Answer*. That, at short glances, the differences may be the more rapidly and clearly apprehended.

Question 2. Why, for trunks, at different distances from the universal trunk, employ types of different *sizes*? *Answer*. That the relations, which have place, in respect of extent of import, between these

several terms, may be the more rapidly and clearly apprehended.

Question 3. For the English many-worded appellatives, (viz. epithets) inserted for the explanation of the corresponding *Greek-sprung*, and mostly new-coined, appellatives, why employ so small a type?—*Answer.* In order that, forming as it were so many botches, they may, while offering themselves to the eye, rather recede from it than meet it, so as not to be looked at, but in proportion as the demand for the use of them presents itself.

Uncouth as this portion of the language here employed cannot be denied to be, it is not more so than that in which, for the accommodation of English readers, entire works, viz. on the subject of *Botany*, may be seen composed.

Question 4. For those names of arts and sciences which are already in familiar use, why employ large and conspicuous capitals? *Answer.* That with a particular degree of force they may attract the eye: two main uses of the Table being the helping to fix the imports respectively attached to these most frequently employed appellatives, and to exhibit to view, in the clearest manner, the mutual relations between the objects which they are respectively employed to designate.

22. By the familiar sign, composed of the letters *i. e.*—initials of the Latin words, *id est*,—the eye is throughout conducted to the above-mentioned explanatory words, explanatory of the Greek-

sprung adjectives. By the kindred sign,—*viz.* for *videlicet*,—to those appellatives in common use, to which, for the reason above-mentioned, the types called *capitals* have been allotted.

23. Though, by means of some of the above-mentioned appellatives,—viz. *trunk*, *universal trunk*, *partial trunks* and *intermediate branches*—the matter of the Table is spoken of as if it were arranged in the form of *a tree*, yet the position of the object styled the *universal trunk*, is at the top of the Table; and that of the *branches*, instead of being higher and higher, is lower and lower, as they recede from it.—*Question.* Why this apparent contradiction and incongruity?—*Answer.* That,—here, in the tabular diagram, as in the continued explanatory discourse,—those parts, which, for the understanding of it, require to be first read, may be the first to meet the eye. Nor, at bottom, is there any absolute contradiction in the case. *Roots*, as well as *trunks*, have their *branches:* and in the instance of a numerous tribe of plants,—in a word, in that of *trees* in general,—by so simple a cause as a change in the surrounding medium,—branches being buried in the earth, while roots are exposed to the air,—not only under the hand of the artist, but even under the hand of Nature, roots are found convertible into branches, as well as branches into roots.

§ 10. *Uses of a Synoptic Encyclopedical Table or Diagram.*

By the name of an *Encyclopedical Sketch*, two perfectly different, however nearly related, objects may, with equal propriety, be designated, and under that common appellative thereby comprehended. The use is, a *continued discourse*, expressed in the forms of ordinary language: the other is a *Systematic Table* or *Diagram*, so constructed as to be in some degree *emblematic*. In the continued discourse, the relations in question are expressed at length in words and words alone:—in the emblematic diagram some *image* is employed, by reason of which, while by their respective names, the objects in question are presented to the eye, all of them in the same place, and at the same time, certain *relations** which they bear to one another, are

---

* Pleading for his quondam instructor, the poet *Archias*, "Between art and art," (says *Cicero*), there exists throughout the whole assemblage of them, *commune vinculum*—a common tie.—True:—and that tie is the one already above indicated: viz. their common *object—well-being*,—by which they are constituted so many branches of the universal art—*Eudæmonics*.—Between art and art?—Yes; and moreover between *science* and *science:* and of these the common tie is their common *subject*, viz. *substance:** and by this common tie it is that they are con-

* In the import of this word,—in the sense in which, by the *Aristotelians*—at any rate by the *Christian* followers of that philosophy—it has always been employed,—is included (it should be remembered) not *matter* only (i. e. all *bodies*) but *mind*.

at the same time held up to view. As to the image, that of a *tree*, with its *trunk* and *branches*, is that which, in the earliest example known,* was thus employed; nor does it appear that the nature of the

---

stituted so many branches of the universal *science—outology*:—*particular* as well as *general* outology included, as above (§ 8).—But, between *art*, taken in its whole extent, and *science*, taken in its whole extent, there runs throughout that all-pervading and most intimate connexion, which has above been brought to view: (See Tab. I. Note 9.) For the arts he was speaking of, the Orator might thus, in virtue of this connexion, supposing him aware of it, and supposing it to have been suitable to his purpose and to the occasion, have found two, viz. the two above-mentioned, common ties.

Not that, in any part of the field, any such conception, as it is in the power of any of the words in question to convey, of those *general* ideas, of which they are respectively the names, can serve in the place of ideas derived from the perception of individuals—of the correspondent individual objects respectively contained in them. No: it is only through *individual* objects, that any clear and adequate ideas are presented and lodged in the mind: and it is the opposite notion, that constituted the all-pervading error of the class of philosophers called the *Schoolmen* or *School-Logicians*, and gave, to little less than the whole mass of knowledge or supposed knowledge of those times, the character of a nut-shell without a kernel, or a skull without brains.

But what it *is* in the power of these words to do is—to afford so many ready *receptacles*, as it were, or *boxes*, in which the *individual ideas*,—in proportion as they are drawn forth from the *individual objects* which are their *sources*,—may be lodged and deposited, in such manner as to take hold of the memory, and there to remain, in readiness to be, at any time, called up for use.

* Viz. The *Tree* of *Porphyrius*, as exhibited in the Table hereto annexed. For explanation, see the next Section.

case affords any object better adapted to this purpose.

To the form of *a continued discourse* the advantage attached is—that the quantity of explanation given by it is not restricted: but with this advantage is connected a disadvantage, viz. that, if it be of a certain length, it is only in succession that the several parts of it are presented to, and can be taken cognizance of by, the eye: so that, unless it be under the constantly repeated trouble and embarrassment, of turning backwards and forwards, leaf after leaf, or that of a constant strain upon the memory, or both,—no comparison of part to part can be made.

In *the systematic diagram*, the advantage is—that, for the purpose of uninterrupted and universal comparison, continued to any length, after the objects with their several relations have been respectively explained,—each of them, at whatever length may have been deemed requisite, in and by the continued discourse,—the whole assemblage of them is, or at least, as above mentioned, may be, so brought together, as to be kept under the eye at once, forming as it were so many parts of one and the same picture.

Thus it is, that to this form two perfectly distinguishable, howsoever closely connected, advantages, both of them of a practical nature, are attached:—in the first place, of the whole matter taken together, *conception* is facilitated and expedited: in the next place, *comparison*—reciprocal comparison—the articles being capable of being run over for all

purposes, in all directions, and in all imaginable orders of succession,—without interruption, and with that *rapidity* which is proverbial, as being among the characters of *thought*.

To set against these advantages, no disadvantage has place, except that to the quantity of matter, to which *this* form is capable of being given, there are limits which apply not to the other. But, within these limits, here,—as in a *map* or an assortment of maps,—it is seldom that, be the purpose what it may, within the quantity of space capable of being thus employed, a quantity of matter sufficient for the purpose will not be capable of being displayed.

Anterior to the time of Bacon, were the profit worth the trouble, Encyclopedical Sketches might, even in the *tabular* form, it is believed, be found, and in both forms in no inconsiderable abundance. But, by the true lights, shed upon the field of *thought and action*, and thence upon the field of *art and science*, by that resplendent genius, all those false lights have been extinguished.

Of the two above-distinguished forms, of which an Encyclopedical Sketch is susceptible, the only one, however, of which the works of Bacon afford an exemplification, is that of a continued discourse —the *purely verbal* form.

In like manner, in no other than the purely verbal form,—and that too wrought in a looser texture,—may be seen the Encyclopedical Sketch,

prefixed by *Ephraim Chambers* to his Dictionary of Arts and Sciences.

With the two Encyclopedical Sketches of *Bacon* and *Chambers* before him, *D'Alembert* prefixed to the French *Encyclopedia* his Encyclopedical Sketch, in the *purely verbal* form, taken, as he says, chiefly from Bacon: and moreover,—and for the first time reckoning from the days of Bacon,—that correspondent sketch, in the form of a *systematic diagram*, which is here copied,* and which has been the subject of the remarks given above.

This diagram is exhibited by him in the character of the principal object: and it is in the character of an *Explanation* of that principal object, that the continued and purely verbal discourse attached to it, is delivered by him.

Notwithstanding the imperfections above held up to view,—to which others might have been added,—signal was the service, which, in the estimation of the author's collaborators,—among whom were numbered almost all the men of any literary eminence whom France at that time afforded,—was rendered by the instrument so constructed as hath been seen. In it they beheld—nor with other eyes has it been beholden (it is believed) in that or other countries, by their contemporaries or their successors—a sort of *novum organum* in miniature: a sort of instrument, which every man, to whose lot

---

* See the Table.

it has fallen, to labour, upon a scale of any considerable extent, in any part of the field of art and science, ought to have constantly in his hands and before his eyes.

To what instruction soever may have been extractible from that diagram, whether any and what addition has been afforded, by the remarks herein above made on it, together with the subjoined sample of another, executed upon a plan considerably different, the reader will judge.

A Table of this sort may be considered as an instrument in the hand of *Analogy*.

Scarce will the *art* be found, from which, through the medium of *Analogy*, assistance may not, in some shape or other, be borrowed by *some* other art—not to say by *every* other.

By *Analogy*, scarce will the article of *knowledge* be found, by which, in some shape or other, *light* may not be received from some other—not to say every other.*

Conception—retention—combination—generalization—analysis—distribution—comparison—methodization—invention—for all or any of these purposes, with an Encyclopedical tree in his hand, suited to the particular object which he has in view—skipping backwards and forwards, with the rapidity of thought, from twig to twig, hunting out and pursuing whatsoever analogies it appears to

---

* See Note, page 232.

afford, the eye of the artist or of the man of science may, at pleasure, make its profit, of the labour expended on this field.

Yes: true it is—that, no otherwise than through individual objects, can any clear ideas be imbibed, from the names of those ideal aggregates or bundles, of different sorts and sizes, into which, by the associating and dividing power of those appellations, they are collected and distributed. But, from a comparatively small number of individual objects, may be obtained very instructive and practically serviceable ideas, of very extensive aggregates. Many years ago, forty thousand, or thereabouts, was supposed to be the number of *species* of plants at that time more or less known: forty thousand, the number of those ideal aggregates, designated by the name of *species:* millions of millions the number of the individuals at each moment designated by those same specific names. Yet from any one of those individuals may be abstracted a tolerably adequate idea, of the species in which it is considered as contained: and how small is the number of species necessary to plant in the mind the prodigiously extensive idea, designated by the word *plant!*

By attention, applying itself all along with still closer and closer grasp—by this faculty it is, that advances—fresh and fresh advances—all of them so many conquests—are continually made in the field of art and science. Each laborious and inven-

tive adventurer proceeds on in the wilderness, as far as his inclination and the force of his mind will carry him. Sooner or later, the same man or another—more frequently another—makes a road—whereby, to succeeding travellers, the quantity of labour necessary to the reaching of that farthest point is more or less reduced. By successive labourers of this pioneering class, the road is made gradually smoother and smoother. Where one ends, another begins: and hence it is that the veriest pigmy is at present able to look down, from a point, which by his utmost exertions the giant of anterior times could never reach.

That, of the branches of Art and Science, which, by the denominations here employed are thus endeavoured to be brought to view, the distinctness is, in a multitude of instances, far from corresponding to the distinctness of the denominations themselves, is but too true, and presents to view an imperfection no less undeniable than it is believed to be irremediable. In this track, approximation is, throughout, the utmost that can be hoped for. But, unless and until some other scheme of distribution shall have been found,—such as shall be exempt from, or at least in a less degree exposed to, this imputation of indistinctness, than that which is here submitted,—the imperfection, so long as the work has any use, will not afford any sufficient reason for leaving it unattempted. That no scheme will be found altogether exempt from the imperfec-

tion, may be asserted with full assurance: and, if any scheme less tinctured with it than the present one is, could on this occasion, and by these eyes have been found, *that* and not *this*, would have been the scheme in *this* place brought to view.

Let it not at any rate be said, that, by reason of this indistinctness, it is no more than upon a par with those other Encyclopedical Sketches, in the hope of superseding which, it has been framed. Between the degree, and even the species of indistinctness, which has place in the two cases, wide indeed (it is believed) will be seen to be the difference. In *this* sketch (to borrow a phrase from Scottish history)—in this sketch, may here and there be found (it is true) a small proportion of *debatable land*, concerning which it may be dubious, to which of two contiguous districts it may with most propriety be said to belong: but in *those* cases, many are the instances, in which the whole of the territory, which is represented as belonging exclusively to one of two districts, may, with equal propriety, be said to belong to either or to both.

§ XI. *The Mode of Division should, as far as may be, be exhaustive—why?*

If, of a sketch of the kind in question, the utility is by any person recognized,—to satisfy him of the utility of its being rendered *exhaustive*, not many

words can, it is supposed, be necessary. To be *exhaustive*, the parts which, at each partition or division so made, are the results of the operation,—must, if put together again, be equal to the whole,—and thus, and in this sense, *exhaust* (to use the word employed by logicians) the contents of the whole. It is only in so far as the divisions which it contains are, in this sense, respectively *exhaustive*, that the information, contained in a work which is composed of them can be *complete*—can be what it appears to *undertake* for being—can be what it *might* be—and what, if it might, it *ought* to be. This being the case, if it be *not* exhaustive, every proposition, in which the exhaustiveness and completeness of the division is assumed, will, in so far as the assumption is proceeded upon, be, *pro tanto*, erroneous and incorrect; and, if received and acted upon, delusive: and, in whatsoever stage of the division the incompleteness has place, the consequence is—that, in every sub-division, the original imperfection is repeated, and the correspondent part of the work tainted with it.

But it is only by means of a system of division, carried on in the thus *declaredly* exhaustive mode, that any assurance can be afforded or obtained, that the survey taken of the field of *thought and action*,—and therein of the field of *science and art*, or of whatsoever portion of that field is proposed to be comprehended, in the survey,—is complete; any assurance, that, in the course of the progress

made through it, a number of parts, in unlimited abundance, each to an unlimited extent, may not have been omitted.

It is only in this way, that, even supposing the whole to have been actually embraced and comprehended in the survey, it can, in the mind that has embraced it, wear the aspect and character of *a whole:* instead of that of a regular *tree*, the form in which it presents itself will be no other than that of a confused heap of unconnected fragments,—each of them, in respect of *form* and *quantity*, boundless and indeterminate.

In the body of this work, intimation was given of what presented itself as the chief use, derivable from an insight, more or less extensive, into those foreign languages, ancient and modern, in which the vernacular language has its roots. It consists (it was said) in *this*, viz. that, to an eye thus instructed, in the whole field of the language, there being no *hard words*, there shall be no absolutely *dark spots;* nothing that shall have the effect of casting a damp upon the mind, by presenting to it the idea of its ignorance, and thence of its weakness.

Correspondent to the sort of consciousness of power so obtainable in the field of language, is that which, by means of a set of *systematic sketches*, —and, in particular, by means of a set of *systematic* and *tabular diagrams*,—always supposing the mode pursued to be exhaustive,—may be ob-

tained and exercised over the field of *art and science*. No parts in it, from which,—through the medium of these appropriate denominations, the relations of which, as well those to one another, as to the matter of the body or branch of art and science, are determined and brought to view,—ideas, more or less clear, *correct*, and *complete*, are not radiated to the surveying eye: in a word, no absolutely *dark spots:* no words that do not contribute their share towards the production of so desirable an effect, as that of substituting the exhilarating perception of mental strength, to the humiliating consciousness of ignorance and weakness.*

Desirable as this property will, it is hoped, be acknowledged to be, with reference to the purpose at present in question,—a purpose will now be

---

* Words which, whether derived or not from foreign languages, appertain exclusively to particular trades and occupations, will of course continue to operate as so many incidental sources of the sensation of *ignorance:* to a person not correspondently conversant with the language of those particular trades and occupations respectively, there must, in those several divisions of the language, be of course as many *dark spots* as there are of these peculiar words. But, in these instances, it will, by the context of the discourse, be sufficiently shewn, that, by a want of acquaintance with the import of these particular words, nothing worse is indicated, than a correspondent want of acquaintance with the field of that *particular* trade or occupation; not any want of acquaintance with any part of the general body of the language. The language of *seamanship* will afford an example.

mentioned, to which it must be acknowledged not to be applicable. Relations of *logical identity and diversity*,—and relations of *practical dependence*, as between branch and branch—both these sets of *relations* have already been mentioned, as capable of being, with good effect, brought to view in the form of a *synoptic Table*. But, for the exhibition of relations thus different, neither can any one Table, nor any number of Tables, upon this same plan, be made to serve. In the plan, of division and correspondent distribution, pursued in the view given of the *logical* relations as above explained, *exhaustiveness* will indeed always be an essential feature. But where the relations to be exhibited are the *practical* sort of relations just spoken of, viz. those of *dependence*, or say, of *subservience*, (whether the subservience be mutual or but unilateral) the nature of the subject admits not of any such regularity and all-comprehensiveness. From branches of art and science, the most remote from one another in the logical tree, one and the same *art* may be seen looking for assistance. *Natural History*, *Anatomy*, *Chemistry*, *Architecture*, *Political History*, *Ethics*—all these—not to mention any more—the *Painter* (not to speak of the *Poet*) may have occasion to summon to his aid.*

* In the French Encyclopedical Table, so often mentioned, between the art and science of the *Painter* and that of the *Che-*

Exercising dominion over almost every branch of art and science, sometimes in furtherance of the interests of the professors of that particular branch, more frequently and more necessarily in furtherance of the interests of the whole community, the legislator, on pain of acting blindfold, has need of an insight,—the more clear, correct, and extensive the better,—into the matter of every such branch of art and science. For his use, therefore,—to the Table of *logical relations*, exhibited upon an exhaustive plan, a Table of relations of *dependence* or *subservience*, as above explained, constructed upon a plan in which *particularity* and *copiousness* should be the ruling objects, would be an essential accompaniment.

---

mist, according to the view there given of the two objects, there could not be any relation at all, except in so far as *painting* is a branch of *Connoissances Humaines—human knowledges* or *knowledge*. According to that Table, in *painting* (and not only in *painting* but in *engraving*) the only one of the human faculties employed, is the *imagination*: and as, according to the same Table, the *art* of making colours, fit to be used in painting, belongs to *memory*,—and, if it be included in *Chemistry*, the knowledge how to make them, belongs to *Reason*,—the *Painter* might be at some difficulty about his colours, if, for finding out the way to have good ones, he had no other means than what are afforded him by that French Table.

§ XII. *Test of All-comprehensiveness in a Division how constructed—Additional Advantages, Distinctness and Instinctiveness—Bifurcation why necessary.*

A problem is here proposed, and undertaken to be solved.—A logical aggregate of any kind, as designated by any appropriate name, being given, required to divide it into a number of parts, each in like manner designated by a distinctive name, in such sort, that, in the sum of these parts, shall be contained the same individuals, and all the individuals which, and no other individuals than those which are contained in the whole.

Such is the problem, the solution of which is requisite for the present purpose. In other words, the solution of it consists in securing to the *parts*, in which the sort of *whole* in question is to be divided, the *property* of *all-comprehensiveness*.

For the accomplishing of this solution, what has been found necessary, is—the construction of an *instrument*, such as, being employed in the divisional operation in question, and thereby in the conformation of the parts, which are the results of it, shall serve as a *test*—in such sort, as to demonstrate, if such be really the case, that the division there effected is in fact an all-comprehensive one: call it accordingly, *the test of all-comprehensiveness*.

An instrument of this sort has accordingly been constructed;* and, on turning to the Encyclopædical Table, will be seen to have, in every part of it, been explicitly or implicitly employed. It consists in what may be called the *contradictory formula:* the essence of which consists in the sign of *negation*, employed or employable in the designation of some one in each pair of branches, and *not* in that of the other.—But of this presently.

In and by the word *pair*, as applied to the branches thus produced, what is already implied is, that, by the instrument in question, it is only in the way of *bisection* that the problem can be solved. But in this mode, it will be seen, that every desirable purpose may be accomplished: that it cannot be any other mode; and that on any occasion at pleasure, by division into two parts, division into any other number of parts may, if there be any use in it, be accomplished.

Of the desirable property,—which on this occasion stands as the principal object, and occupies the fore-ground,—*all-comprehensiveness*, having for its synonym, as already explained, the word *exhaustiveness*, is the name. But, by the same means by which to the scheme of division in question this property is secured, two other desirable pro-

* By the mathematical reader, with reference to the solution of the principal problem, the construction of this test may, if he pleases, be considered in the character of a *lemma*.

perties, as it will be seen, are, at this same time, secured, viz. *distinctness* and *instructiveness*.

Intimately as they are connected with the principal property,—and, by the same docimastic instrument secured to the scheme of division executed by means of it,—what will at the same time be seen is—that these two subsidiary properties are not, either of them, inseparable from it. Instances require to be shewn, and will accordingly be shewn, in which a scheme of division is or may be *all-comprehensive* without being *distinct*—and all-comprehensive and *distinct* without being *instructive*.*

---

* On the occasion of every such division, what, to prevent confusion, is altogether necessary, is—that, of the names, given to the parts which are the results of the division, by no one shall any individuals be designated, *other* than those which are comprehended in the aggregate so undertaken to be divided. By the word *preciseness* or *precision* may be designated the ulterior property thus represented as desirable. But, to its presenting this signification, it will be necessary, that the original and material import of the word (*precision* from *precido, to cut off*, viz. every thing that out-stretches the proper line) be at the same time present to the mind.

Of this property, however, to avoid embarrassing the present inquiry with matter which, on the present occasion, has not presented itself as essential to it, no further mention, except what follows in this note, will be made.

In the scheme of division, pursued in the example here given of an encyclopædical tree, this property will, it is believed, be found actually possessed, and that by every branch without

For securing *clearness* to the ideas attached to the names of those three properties, a few words of explanation may have their use.

1. Of *all-comprehensiveness*, with its synonym *exhaustiveness*, enough has in this view been said already.

2. By *distinctness*, as applied to the division in question, (whether by the name *division* what is here meant be the *operation* or the *result*) by distinctness what is meant is—that, of all the individuals contained in the subject of the division,—viz. the *trunk*, or say the *major aggregate*,—it shall, when the division has been performed, be, in the instance of every such individual, clear and manifest to which of the several branches it belongs.

3. By *instructiveness* is meant a property which bears relation, and applies to both the others. It

---

exception. But among the *trivial* or *current* names, which, in the character of synonyms to the names of the branches of the tree in its encyclopædical form, have for illustration been introduced, some may perhaps be found, whose claim to the possession of this property may not present itself as exempt from dispute. This deficiency, in respect of *preciseness*, is among the unavoidable results, of the indeterminateness, which will, in so many instances, be seen to be attached to the names in common use.

Properties may receive explanation from their opposition. *All-comprehensiveness* may be said to have for its opposite, *scantiness; preciseness, extravasation.* Of this last-named property, the *absence* is the *reverse* or *converse* of *scantiness*, the absence of *all-comprehensiveness.*

consists in this; viz. that the words, employed for giving denomination to the branches, shall be such, as to declare and announce, that the division is *all-comprehensive*, as also that it is *distinct*.

Of this property, it will be seen, that neither is it *useless*, nor is the warning, thus given to secure to the scheme of division the benefit of it, *superfluous*. 1. The property is not *useless*. For from the property of *all-comprehensiveness* no use can be derived, but in so far as the scheme of division is understood to be possessed of it: and so in the case of *distinctness*. 2. Neither is the warning superfluous. For, these properties being really possessed by the branches into which the trunk has been divided, are yet,—such are the names by which the branches are designated,—not held up to view by those names, and are therefore of no use. Various, it will be seen, are the instances, in which these properties,—though really possessed by the branches, into which, by the current names employed in the designation of them, the trunk has been divided,—yet (such is the structure of those names) are not held up by them to view, and are therefore of little or no use.

Thus much as to the desirable properties, which, by the test above alluded to, viz. the *contradictory formula*, have been secured, it is supposed, to the scheme of division here employed:—now as to the *contradictory formula* itself.—Examples of it

have been in existence as long as the logical tree of *Rameus*, improperly (as will be seen) attributed to *Porphyrius*, has been in existence.* Examples of it are, as above, the matter of which the Encyclopædical tree here attempted is composed. What remains to be done here is—to point out the precise part to which the appellation is meant to be applied, and the ground on which it has been thus applied.

In the instance of each trunk, observation has been made, of a particular *property*, as being possessed by every individual, to which the name of *generic*, say the *major* or *comprehending* aggregate, employed to represent the *trunk*, is applied: possessed moreover in like manner by every individual, to which the name of the *minor* or *comprehended* aggregate—the relatively specific appellative, employed to designate one of the two *branches*, is applied; but as to the other of the two branches, *not* possessed by any one of the individuals, to which the appellative employed to designate that branch is applied.

Having thus the effect of giving, as it were, *birth* to, and, at any rate, *indication* of, the *distinctness* supposed to be possessed by the two branches, it may be termed the *distinctive property*.

This subject (be it what it may) IS *possessed of*

---

* For this diagram see Tables IV. and V.

this quality (be it what it may),—*this subject* (meaning the same subject)* *is* NOT *possessed of the quality* (meaning the same quality)—these two are—as the logicians call them, and as any body may see they are,—a pair of *contradictory*, (viz. *mutually* contradictory) *propositions:* the former of these may be termed the *positive* contradictory—the other the *negative.*

In regard to *contradictories* (such for shortness is the term employed, instead of saying *a pair of mutually contradictory propositions*)—two observations have been made by logicians, and delivered in the character of axioms.—One is—that, to whatsoever *property*, and with reference to whatsoever *subject*, these opposite assertions are applied, in no instance will they, both of them, be found true. The other is—that, to whatsoever quality, and with reference to whatsoever subject, they are applied, one or other of them will be found true.†

---

* Viz. if it be an individual, the same individual—the same in all its parts; if an aggregate, an aggregate composed of exactly the same individuals, neither more nor less.

The portion of *time* in question must also be, in both instances, exactly the same; for it may be that, at one time, the individual *is* possessed of the property in question; at another time *not* possessed of it.

† If, so far as it goes, the account *here* given of *contradictories* is correct and clear, that which may be seen given by the Aristotelian logicians will hardly be found in complete pos-

An example may here perhaps be required. Turning to the Encyclopedical tree (letter-press or diagram) take then for the *dividendum*—viz. the *trunk* or *major aggregate*—the branch of art and science therein denominated *Posology*, but commonly called *Mathematics*. It having been proposed, in an *all-comprehensive* and distinct manner to divide this *major aggregate* into two

---

session of either of these desirable qualities. Only between *assertions*, surely, can *contradictoriness* have place: yet, by Saunderson, it is spoken of as having place between two *terms*. Of the two above-mentioned *axioms*, which have *contradictories* for their subject, it has been seen how well they correspond.—Yet, by Saunderson, one of them, viz. the one last mentioned, is represented as applying to *terms* alone,* nothing being therein said of *propositions*: the other, as applying to entire propositions alone,† nothing being there said of *terms*: and of these axioms, that which is applied to terms alone, instead of constituting a rule of itself, is, in the form of a *parenthesis*, sunk as it were under the head of another rule, which seems far from equalling it in clearness.—Though really derived from the Aristotelian logic, the account here given of *contradictories* not being exactly conformable to the account given in that system,—what difference there is between the two accounts might, but for this warning, be liable to be, without further scrutiny, supposed to be the result of misconception.

To obviate any such supposition, it seemed necessary thus to give a brief intimation, of the considerations, by which the departure here made from the authoritative standard seemed necessitated. Could room have been spared, other supposed imperfections in the Aristotelian account of the matter might here have been pointed out.

* p. 40. † p. 72.

minor aggregates, exhibited in the character of *branches*, a *property* was looked out for, which, being possessed by every individual object comprehended in the *major* aggregate, as also by every individual in one of the two aggregates into which the major aggregate was to be divided,—and at the same time *not* possessed by any individual *not* comprehended in that same minor aggregate,—might, for the purpose of distinguishing each of the two minor aggregates from the other, serve in the character of a *distinctive property*. In the property of bearing relation to *form*, or say *figure*—i. e. in the property of taking for its subject *form* or *figure*—a property which seemed capable of being employed in the character of a *distinctive property* was found. Of the two *minor* aggregates, into which, by this means, the *major* aggregate, *Posology* or *Mathematics*, was divided,—*form-regarding*, or *figure-regarding* Posology or Mathematics, in *Greek-sprung* language, *Morphoscopic Posology*, was the name given to the *positive* minor aggregate: this done, the name of the *negative* minor aggregate was thereby determined and given, viz. *form-not-regarding*, in *Greek-sprung* language, *Amorphoscopic* Posology, or, to exclude ambiguity *Alegomorphoscopic*.

But, in that portion of the matter of discourse, which in the Table is employed, for giving expression to these two *minor* aggregates, in the character of branches of the *major* aggregate, of the

division of which they are the *immediate* results, is contained the import of the above-mentioned *formula*, brought to view under the name of the *contradictory formula*. The division, of which they are the results, is therefore, at the same time *all-comprehensive* (or say *exhaustive*) and *distinct*. It is moreover *instructive*: for, in and by the terms of it, the *all-comprehensiveness* and *distinctness*, which really belong to it, are declared. Speaking of propositions, delivered on the subject of *Mathematics*.—*This proposition does regard figure*.—*This proposition does not regard figure*—of no one *proposition*,* delivered on the subject of Mathema-

* [*Proposition*,] Note, that the sense in which the word *proposition* is here employed, is not that in which it is commonly employed by *Mathematicians*, but that in which it is employed by *Logicians*. If the former were the sense put upon it, the *distinctness*, here ascribed to the two branches, might not be very readily recognized, if, indeed, it would really be to be found. So apt are mathematical men to go backwards and forwards, between the *geometrical* and the *algebraical* mode of expression, according to the supposed convenience of the occasion and the moment, in a manner as it were mechanical, and almost without notice taken of the difference,—what may very well happen is—that of what may, in the mathematical sense, be one and the same *proposition*, in one part *figure* may *be*, and in another part *not* be, an object of regard. But, because two things are capable of being mixed together, it follows not that in their own natures they are not distinct: and, taking the word *proposition*, in the *logical* sense, scarcely will it be said, that, in one and the same *proposition*, the matter is spoken of at the same

tics, will these two contradictories be found, both of them, to hold good: and if, of all the *propositions*, which *do* thus regard *figure*, one branch of Mathematics be (and there is nothing to hinder it from being) composed, and of all those which do not thus regard figure, another, and the whole of that other branch; here we have two branches, in one or other of which every conceivable proposition belonging to mathematics will be found to be contained.

For each one of these *minor* aggregates or branches,—when in the character of a *major* aggregate, in pursuance of the divisional process, it came itself to be divided,—in lieu of, or at least in addition to, the *many-worded* appellative, which, in its character of a *branch*, is, in the first instance, employed to designate it, there should be a *single-worded* appellative. In the words *Geometry* and *Arithmetic*, two words in current use presented themselves as being,—and that without any violence done to their established imports,—capable of being employed in this character; i. e. as comprehending between them the whole of the import, which either *is*, or with propriety *can be*, comprehended in the import of the word *mathematics*:—with propriety, i. e. without out-stretching* the

time in a Geometrical and in an Arithmetical point of view,—spoken of *with* reference to figure, and *not* with reference to figure at the same time.

* [*Out-stretching.*] See above, Note to p. 248.

most extensive import, for the designation of which that appellative has ever been employed.

On this occasion, the pair of names, which, for these two branches of mathematics, have, on this occasion, been, in the *first* place, *brought to view*, are the two newly-devised *many-worded* ones. But the pair of names, by which *those* names, and the relation of which they are expressive, were, in the first instance, *suggested*, are the two old-established *single-worded* ones. *Geometry* and *Arithmetic*, considered as branches of art and science, in what particular, it was asked, do they *agree?*—The answer was obvious enough:—as being, both of them, branches of *Mathematics*. So far so good. But, forasmuch as they are not the same branch, in what is it that they differ? Of a survey taken of the contents of each, with a view to this question, the result was *that*, to which, as above, the pair of *many-worded applications* have given expression. In one of them *figure* is regarded; in the other, *not*.

Now then, thanks to the Encyclopedical names, —of the two trivial names, viz. *Geometry* and *Arithmetic*, which are in use to be employed in the designation of these two branches of mathematical art and science, the *all-comprehensiveness** will, it

* [*All-comprehensiveness.*] True it is, that, to the purpose of its being regarded as *all-comprehensive* (this division of *Mathematics* into *Geometry* and *Arithmetic*) it is necessary that, under

is believed, be readily enough, and generally enough

Arithmetic, Algebra should be considered as comprehended: but about this there cannot be any difficulty; since, by Newton (as appears by his work, entituled *Arithmetica Universalis,)*—by Newton and so many others—it is spoken of as thus included.

True also it is—that, to this same purpose, it is equally necessary that, under *Algebra, Fluxions*, which, on this supposition, might, in the many-worded form, be denominated *Fluxional Algebra*, should be considered as included. But, upon consideration, neither in this case, it is believed, will there be found any serious difficulty. Applicable, with equal propriety, to *Fluxions*, as well as to whatever part of Algebra cannot be brought under the denomination of *Fluxions*, will be found the appellative *Agnosto-symbolic:* Agnosto symbolic, i. e. *expressed by signs unknown;*—by *signs*, of which, in the first instance, antecedently to the solution of the problem the value and import is not known:—known in the same degree of clearness as those of which the written language, peculiar to *common Arithmetic*, is composed.

This division of *Algebra*, into *common* and *fluxional*, would any one wish to see it expressed in the language of the *Encyclopædical tree?* In the solution of this logical problem there would not, it is believed, be found much difficulty; and by this means an exemplification may be afforded of the method in which, in any given part of it, the process by which these first lines of the Encyclopædical tree have been constructed, may at pleasure be carried on to any further length.

For distinguishing *Fluxional* from *Common* Algebra, take, for the distinctive property of *Fluxions*, the fiction by which in this case, for the production of the quantities in question,—for the *genesis* or *generation* of them (to use the language of Mathematicians),—*motion* is supposed. If this assumption be admitted as correct, *Algebra* being taken for the immediate *trunk*, here then we have,—for the *positive* branch *Cineziopfeustic, (motion-feigning;*

recognized: nor will the *distinctness*,* it is believed, be found to be in any greater degree exposed to dispute.

At the same time, in regard to *instructiveness*, as above explained, the utter absence of this quality will, in the instance of both these trivial names, be found, it is believed, equally manifest: and thence it was, that, as soon as it did present itself, it was in the character of a sort of *discovery*, that the coincidence of these two imports, with the imports of the two many-worded appellatives to which they are here stated as being respectively synonymous, presented itself:—and, in this same

---

for the *negative* branch, *Acinesiopfeustic (motion not feigning)*. By him, by whom, being considered in the *Newtonian* point of view, the subject of the branch in question is accordingly treated of in the *Newtonian* language, the propriety, of the denomination, thus proposed for the positive branch, will not, it is believed, be considered as being exposed to dispute. Whether for the same branch, or at any rate the mostly correspondent branch, if considered in the *Leibnitzian* point of view, and in the Leibnitzian language, (*that* being the language mostly employed on the Continent) styled the *Calculus differentialis et integralis*, (in French, *Calcul differentiel et integral)*, the same Encyclopædical *division*, with or without the same *nomenclature*, would, and with equal propriety might, be made to serve, is an inquiry which stands too wide of the present disquisition to be endeavoured to be comprised in it.

* [*Distinctness.*] See above, p. 255, Note, on the word [*proposition.*]

character, howsoever it may be in the case of *an adept*, in the case of many a learner, there seems little doubt of its presenting itself.

Of the nature of the *contradictory formula*, the explanation above given will, it is hoped, be found tolerably intelligible. Its capacity of serving, in the character of a *test* of *all-comprehensiveness* and *distinctness*, in a logical division, will also, it is hoped, be recognized. In the formation, of the Encyclopædical appellatives employed in the Table, this test will, in several instances, be seen actually and explicitly employed, included as it is in the composition of the words themselves. Other instances however there are in which it is not thus employed. In the production of this omission, two considerations, whether sufficient or not, concurred:—one was:—that, by the employment of the two epithets, *both* in the positive form and independent of each other, instead of no more than one positive, one with the correspondent negative, a greater quantity of instruction might, in a given compass, be conveyed: the other was—that, in some instances, doubts seemed to hang over the question—which of the two contradictory properties should be presented in the *positive* form; which in the negative: and, on whichever side the determination might happen to fall,—for explaining the grounds of such determination, more words might become necessary than could well be spared. Of the plan of nomenclature here pursued, the cha-

racteristic property accordingly is—*not* that, in the composition of either name of the pair, the criterion in question—the sign of the contradictory formula—has in every instance been *actually* employed; but that, in the character of a *test* of the all-comprehensiveness and distinctness of the division, in the expression of which these names have been employed, a pair of names, in one of which this sign is employed, may, without misrepresentation, in every instance in which it has not been thus employed, be added or substituted.*

Of the lights, which the nature of the work admits of and requires, the Encyclopædical names thus provided, though they are the only *instruments*, are not, it should be observed, the only

---

* Thus it is, that, in every instance, the proposed *test*, and the capacity of the division to endure the application of it, have been kept in view. The difference is—that, in some instances, in the composition of the appellatives in question, the application of this test has been actually made—made by the author himself,—in other instances left to the reader. If, in the eyes of any student in logic, this work should happen to find favour, the application of this test would, it is believed, be found capable of affording him a not altogether uninstructive exercise. But if, by the mere use of this instrument, in its present shape, instruction may thus be gained, much greater is the degree of instruction capable of being gained by the endeavour to improve upon it: and with whatsoever degree of success it may happen to any such endeavour to be attended, any labour thus employed, he may be well assured, so far as instruction to the labourer himself is a gain, will not be lost.

objects. Other objects, for the illustration of which the demand, as being much more general, is accordingly still more urgent, are those *current* names, examples of which have just been brought to view,—and which, wheresoever they could be found, have been sought out, and put by the side of those Encyclopædical names, with the imports of which their respective imports seemed to approach nearest to a coincidence.

Unfortunately, that this coincidence should be perfect, is in many instances plainly impossible: such it will be seen to be in every instance, in which the import attached to the current name is in any degree *indeterminate;* and the further this import is from being determinate, the further will the agreement be from amounting to a perfect coincidence. Unfortunately again, these instances are at present but too numerous: of one of these mention has already been made; and, without need of looking elsewhere, among such of these names as are comprehended in this Table, other instances will, it is believed, be found observable.

To the satisfaction of the reader, that, in so far as it has place, observation of the impossibility in question should be taken, is highly necessary: otherwise, where every thing has been done that can be done, it may appear to him that nothing has been done. To give determinateness to the import of an appellative of his own framing de-

pends upon the author: not so as to that of any of those which he finds already made. Towards effecting that coincidence, which, as above-mentioned, is so highly desirable, all that depends upon *him*, is, in the first place, to give to the appellatives of his own framing that degree of determinateness which the nature of the case admits of; and in the next place, among those which he finds ready made, to choose for synonyms to those of his own making, such trivial names, the import of which appears, upon the whole, to come nearest to that of his own, being at the same time, if in any, in the smallest degree indeterminate.

For securing determinateness to those of his own framing, the established logical expedient of the *distinctive property* afforded to the author of this Table an effectual means: for choosing out of the existing stock of trivial names such as should stand least exposed to the imputation of indeterminateness, no equal security could be afforded by the nature of the case.

In this way, though by no direct and immediate means can determinateness be given to the import of those current names, of which at present the import is indeterminate, yet in time, and by means of the instrument of fixation here brought to view, a desideratum so desirable may gradually perhaps be accomplished. By the supposition, a standard of comparison and reference will have been set up: supposing it to be what it is intended to be—and, in

the nature of the case, well capable of being, made —supposing it to be in itself clear, and as near as may be to the range of the variable one,—conformity to this standard will be found matter of general convenience: and in proportion as the fixt import comes to be adopted, the varying one, in all its variations, will drop out of use.

What if, in this way, and by these means, the import of all words,—especially of all words belonging to the field of Ethics, including the field of Politics, and therein the field of Political Religion,—should one day become fixt?—What a source of perplexity, of error, of discord, and even of bloodshed, would be dried up!—Towards a consummation thus devoutly to be wished, there does seem to be a natural tendency. But, ere this auspicious tendency shall have been perfected into effect, how many centuries—not to say tens of centuries—must have passed away!

All this while, on the nearness of the approach made to a perfect coincidence, depend the strength and utility of the mental light capable of being reflected upon each other's import, by the two denominations—the *Encyclopedical* and the *trivial*. Hence comes the need of a *memento*, to which expression may be given by the following rule.—For determining the contents of the two *branches*, into which the *trunk* in question is to be divided,—look out for that *distinctive property*, by the application of which such a pair of branches shall be produced,

the imports of which shall come as near as possible to the imports of the two appellatives already in current use.

Of the above rule, in no instance will any neglect be followed by impunity. He who, taking up a word, gives a definition of it, issues thereby a requisition, calling upon as many as read or hear of it, to use the word in that sense. Let the word thus defined be a word of a man's own creation,—in this case, if so it be, that for this new-invented instrument an adequate use can be found,—provided also that the newly attributed import is not contradictory to any import already attached to it,—if both these conditions are fulfilled, then so it is that for any expectation he may happen to entertain of seeing the requisition generally complied with, a substantial ground has been laid. On the other hand, if it be a word in common use, in that case, if the import thus newly endeavoured to be attached to it be to a certain degree at variance with common use, the consequence is—what?—that, against the sort of *law*, which he is thus taking upon himself to enact, he finds (nor is there any reason why he should not find) as many *rebels*, as there are persons, by whom, in its old established sense, the word has been in use to be employed.

Fixation, yes: this may be endured: comparatively at least, the thing is not difficult: the use is

manifest. *Substitution*, no: the difficulty is extreme; and that difficulty not atoned for by any the smallest use.

1. Define your words, says the capital rule, laid down, and so much insisted upon, by *Locke*.—Yes:—define your words.—But, in addition to this rule, a subsidiary one there is, the demand for which will, it is believed, be scarcely found less imperative.

2. In defining a word, if it be a word in current use, be it your care, that the import you are thus endeavouring to attach to it, be not only *determinate*, but as near to the *current* import, as a determinate import can be to an indeterminate one.

In the character of a distinguishable addition to the mass of instruction afforded by means of the *contradictory formula*, may perhaps be mentioned the series of those *definitions*, which thus in substance, and almost in form, presenting themselves at every joint, give to the whole system a degree of precision and compactness, altogether incapable of being infused into it by any other means. So many pairs of *branches* or *minor aggregates*, so many pairs of *definitions*: *major* aggregate, at each joint, a *genus*: its two immediate branches the two *minor* aggregates, its *species*: the *distinctive property*, with its negative, the two *specific* or *differential characters*. To this advantage a brief reference has been already made, viz. in the section (§ 9), in

which the particular characters of the Encyclopedical tree are brought to view.*

Such being the advantages, indicated by the terms *all-comprehensiveness*, *distinctness* and *instructiveness*, as applied to a scheme of logical division, —in the next place comes the question—in what way, if in any, is the existence of these advantages attached to the use of the *bifurcate*, as contradistinguished from the *multifurcate* mode?

---

* [*Definitions.*] These definitions present themselves naturally in the character of *answers* to so many *questions*, which, in a course of instruction, administered in the mode now so well known by the name of the *interrogative* mode, might be applied to the matter of any such scientific tree. And thus, pursuing the phraseology, as well as the method applied in the *National Society* Schools to the *Church-of-England Catechism*, we have the matter of the *tree of art and science* "*broken into short questions.*" In what degree soever, on the superior ground of importance the matter of this Encyclopedical tree may fall below the matter of that consecrated formulary, on the ground of facility of intellection it will scarcely be thought to yield to it.

1. What is Mathematics? *Answer.* The branch of art and science which has for its subject *quantity*.

2. What is the Encyclopedical name for Mathematics? Answer. *Posology*.

3. What is *Geometry*, expressed in the Encyclopedical language? Answer. *Morphoscopic Posology*.

4. What is *Arithmetic*, expressed in Encyclopedical language? Answer. *Alegomorphic Posology*.

To the above will be added of course, the questions adapted to the extraction of the requisite ulterior explanations. But of these the above sample will, it is believed, be found to suffice.

To this question the answer has probably, in the mind of many a reader, already presented itself. To the *bifurcate* mode alone—to the *bifurcate* mode, and not to the multifurcate—is the test of all-comprehensiveness and distinctness,—viz. the *contradictory formula*, applicable.

After the explanation above given, exists there any person, in whose eyes, when compared with the *bifurcate*, the multifurcate mode would be preferable? To a tree, or any part of a tree, once constructed in the *bifurcate* mode, might be substituted a tree constructed in the multifurcate mode, without trouble and almost without a thought. Throw out the Encyclopedical names, —put together the current names,—the thing is done. The plan of division pursued, suppose it all along all-comprehensive and distinct, the all-comprehensiveness and the distinctness would, after this change, remain to the matter as expressed in the multifurcate mode,—but the *proof* of its being *all-comprehensive*, the *proof* of its being *distinct*, and the *instruction* afforded by the language by which this proof is expressed—all this would be gone. After these deductions made, by this means, out of a system constructed and exhibited in the *bifurcate* mode, you might have remaining a system equally good, constructed, or at least *exhibited* in the *multifurcate* mode.—Constructed?—Yes: but in what manner? Exactly in the manner in which, in his oration given to an audience of *Shoe-makers*,

Orator Henley shewed them how, by one man, a gross of *shoes* might be made in a day: viz. by cutting them out of a gross of *boots*.

Of this conversion the converse would not be altogether so easy. Nor indeed, without addition, supposing the multifurcate tree to be, in any one of its ramifications, less than all-comprehensive, would it be possible. On the opposite supposition, however, i. e. if in every one of its ramifications it be supposed to be all-comprehensive, the converse would be possible. Of the required *bifurcate* tree, the matter would, on this supposition, *in part*, though only in part, be given: and, as to the mode of filling up the deficiencies, it has already been explained, and may be seen exemplified in the Table.

Of a division, which in the article of *all-comprehensiveness*, is *deficient*, an example, should any person be desirous of it, may with equal facility be extracted from the same Table. Take, for instance, *Natural History:* branches, upon the multifurcate plan, supposing it in the execution all-comprehensive, *three:* viz. *Mineralogy*, *Botany*, and *Zoology*. Suppose any one of them left out, thus, instead of the *all-comprehensive* division, you have an imperfect,* or, as Euclid might have said, a *deficient one*.†

---

* Of an imperfect division, *Watts*, in his Logic, undertakes to give an example. But on this occasion he seems not to know

† Elements, B. vi. p. 28.

That, for obtaining a clear, correct, all-comprehensive and commanding view of the contents of any logical aggregate or whole, *bifurcate* in

---

very exactly what he is about. The sort of *aggregate*, which belonged to his subject, was a *logical* aggregate—a *genus*:—such as this Table exhibits in every part of it. The sort of aggregate which he employs for his example is a *physical* aggregate:—an *individual*—any individual of the genus *tree*. The division which he gives, as an example of an imperfect one, is that of a *tree* into *trunk* and *leaves*. What in his view renders it an imperfect one, is but the want of mention made of *root* and *branches*. Not to speak of other parts, two much more important deficiencies are, the want of *flowers* and *fruit*. But the lights struck out by *Linnæus*, had not as yet shone upon the field of *Physiurgics*.

Immediately afterwards, he takes up, indeed, a *logical* aggregate: viz. *Logic* itself. But, for want of some words, perhaps, that were necessary to complete the expression, instead of light, the result is thicker darkness. *Logic*, he supposes, divided into *apprehension*, *judgment*, and *reasoning*. This division gives us another example of an incomplete one: for, to render it complete, *method*, he says, should have been added: of the *art* in question (meaning *logic*) *method* (he says) is a considerable part. Be it so: but *apprehension*, is it also an art? No, surely. Of the art and science of logic it may be taken for one of the *subjects*:—true:—but itself it is neither *art* nor science. Thus, confounding the *subjects* of an *art*, with the *art* itself, what he gives as an example of the division of a logical aggregate, is—a division of it into four parts, of which no more than one can, with any sort of propriety, be spoken of as a part of that same whole. No; nor even *that*, without a force put upon the import of the word. To express a species of *art*—to express an *operation*—*methodization*, not *method*, was the proper word: *method* is—not the *operation* itself, but the *result* of it.

contradistinction to *multifurcate*, is the only adequate mode, another consideration may perhaps help to satisfy us. Of two objects, and no more, can the eye of man, (whether it be of the bodily and real, or the mental and fictitious organ, that the word be understood as designative), obtain any usefully distinct view at the same time. Vibrating, as it were, between the two—and at each vibration, *applying* (as *Euclid* might have said) to the *impression* made by the one, the still vivid *idea**

---

* *Impression*—viz. the effect produced in the mind, at the very time when the object, which is the source of it, being present to bodily sense, is actually the object of the faculty of *perception:—idea*—viz. the effect produced when the object, not being so present, is—or rather the impression made by it as above, is—the object of the faculty of *memory*. The first writer, it is believed, by whom this distinction, so necessary to every clear and correct perception of the phenomena of the human mind, was held up to notice, was David Hume. A consequence is—that, where *observation* is made, of the existence of this or that *relation*,—and, on that occasion, *comparison*, as above, is spoken of as being made, or *distinction* as having place,—if the number of the objects in question is greater than *two*, he, who has to speak of the *relation*, the *comparison*, or the *distinction*, finds himself in a very awkward dilemma. By the preposition *among*—it being scarcely in use for this purpose—scarcely is the import in question presented to view. Comparison of object *with* object, yes: comparison *between* object and object, yes: comparison *between* objects, yes: comparison *among* objects—comparison, for example, *among those three objects*—scarcely: So as to *relation*. Relation of object *to* object, yes: relation *between* object and object, yes: relation *between* objects, yes: re-

of the other, one by one it *can* compare them: but if any greater number, say *three*, be presented to it at the same time, then so it is, that, for any such purpose as that of obtaining a perception of those reciprocal points of coincidence and diversity, ere it can bestow upon them a steady and persevering consideration, it will find itself under the necessity of dividing them, in the first place, into *two* lots: in one of which it will place one of them, and in the other lot either it will place one alone of the two remaining objects, or if both, then, for the purpose of comparing the other object of the comparison, the *two* will be put

---

lation *among* objects—relation *among these three objects*—scarcely. And so, in the instance of the word *distinction*. In these cases what shall be the word employed?—Shall it be the word *among*? Scarcely is the import conveyed: or, if it be, it is not without the idea of impropriety for its accompaniment, that the conveyance of it is made. *Comparison, relation, distinction*, among these three?—scarcely will any such phrase be endurable. Shall it be the word *between*? *comparison between three*? *relation between three*?—the hue of self-contradictoriness presents itself upon the very face of the phrase. By one of the words in it, the number of the objects is asserted to be *three*: by another it is asserted to be no more than *two*.

Be this as it may, the confirmation which, from this particularity in the language, though it should be found to be in no more than one language, the motive in question receives, seems equally manifest. To the use thus exclusively made of the word *between*, what could have given rise, but a sort of general, howsoever indistinct, perception, that it is only *one to one* that objects can, in any continued manner, be commodiously and effectually compared?

together, and, by conjunction in the same lot, be in imagination reduced to *one*.

Endeavours are used (suppose) to consider and compare all three at the same time. What will be the consequence?—that, while any two of them are thus kept in comparison, the third, before any clear and decided judgment can be formed in relation to these two, will be obtruding itself. Confusion will thus ensue; and a necessity will be found, of recommending the comparison:—and so *toties quoties*.*

---

* On the very face of the portion of language, with which the hand of custom has covered this part of the field, may be seen a testimony—nor that a weak one—in favour of the conception thus hazarded. *Distinction between* is the phrase, not distinction *among*: *comparison between*, not *comparison among*.—Why?—*Answer*. Because it is only *between two* objects that any clear *perception* of distinction can be obtained, at the same time:—because to no greater number of objects than *two* can the *faculty*, and correspondent *operation*, of *comparison* be applied at exactly the same point of time.

Many, in a word, are the occasions, on which,—it being supposed that of certain objects a survey is to be taken, and that survey a *conjunct* one,—it will be found, that, of the two words here in question, viz. *between* and *among*, it is the former only that can with propriety be employed: and, besides these just mentioned, on many others, if not on all occasions, will the like testimony, it is believed, be seen to be afforded.

The truth is—that, on this ground, the English language labours under a defect, which, when it is compared in this particular with other European languages, may perhaps be found peculiar to it. By the derivation, and thence by the *inexcludible*

One word more on the subject of *instructiveness*. In the exhaustively bifurcate mode,—in and by means of the ramified chain of virtual definitions which have been brought to view,—at each joint a pair or rather a triplet of *relations*, have been brought to view: viz. the relation of each *minor aggregate* to the immediate *major aggregate*, and the relation of each *minor aggregate* to the *other*: the two first, relations of *identity* and *coincidence*; the third, a relation of *diversity* and *separation*. But, of every object of the understanding, be it what it may, the nature is the more thoroughly known, the greater the number is of those *relations*†

---

import, of the word *between*, (i. e. *by twain*), the number of the objects, to which this operation is represented as capable of being applied, is confined to two. By the Latin *inter*—by its French derivation *entre*—no such limitation seems to be expressed.*

† [*Relations .... to other objects.*] When first penned, the passage stood as follows:—"*It is only by means of such relations "as it bears to other objects, that any object can be known*" ....— Without explanation, this (it might have appeared) would have been going too far: for, supposing the object in question to contain *parts*, on this supposition the relations which it bore to other objects would not comprehend more than a portion of the whole number of relations of which it was susceptible: in addition to them, there would remain the relations borne to each other by its several *parts*. The only supposition, therefore, on which the position thus discarded would be strictly true, is this,

* To the *Greek*,—the set of *prepositions* which that language furnishes being wretchedly ambiguous, unappropriate, unexpressive,—in vain, on such an occasion, could any reference be made.

which it is seen to bear to *other* objects: and, were it only in virtue of its being *an object of the understanding*, every such object bears some *relation*—in truth a multitude of relations—to every other. —By *Algebra*, whatsoever riddles are solved, are solved—whatsoever is done, is done—by the converting of this or that *unknown* quantity into a *known* one:—a conversion, which neither is, nor ever can be, effected in any other way, than by means of a *relation* which it bears—viz. the relation termed the relation of *equality*,* which, in a case that affords nothing but *quantity*, is the same as the relation of *identity*—to such or such other quantity or quantities, which were known already.

No object is known, but in so far as its *properties* are known: and, for every property, the manifestation of which depends upon any other object, a correspondent *relation* between the two objects must be acknowledged to have place.†

—viz. that the subject of it is an *atom*:—an object too minute to be divisible into parts. On this supposition, if deduction were made of all relation, borne by this atom to objects exterior to itself, after such deduction there would not remain any relations at all. For in the very import of the word *relation*, two objects at least, between which it is considered as having place, are comprehended.—No *powers* for example could the *atom* have: Why? Because no subject would it have to operate upon.

* Hence the term *equation* applied to algebraical propositions.

† *Caution, to prevent that misconception, by which* Aristotle, *after*

bewildering himself, kept the thinking part of the world bewildered for little less than two thousand years—by which he put out the eyes of the otherwise powerful mind of James Harris—*and which, by* Bacon *and* Locke, *has scarcely even yet been completely done away.*

Lest, to the instrument here employed, viz. the *contradictory formula*,—employed as here in the character of a *test* of, and *security* for *all-comprehensiveness* and *distinctness*, in a logical division,—any extraordinary powers, beyond those which really belong to it, should be ascribed—lest, by being employed in the composition of propositions wearing on the face of them the form of *demonstration*, a degree of conclusiveness, independent of *observation* and *experiment*, and superior to any thing which by means of those instruments of knowledge can be produced, should be supposed to be attainable,—this caution is subjoined: —a caution, which, however, to those who by an adequate conception of, and a sufficient attention to, the discoveries made in the region of mind by Bacon and Locke, have learnt to recognize the emptiness of the Aristotelian philosophy, will at the utmost be no more than a *memento*.

Yes, upon *observation* made of individual *perceptions*, and upon the correctness with which it has been made, and the judgments grounded on it deduced, will depend, in every instance, the truth of whatsoever propositions of a *general* nature can, upon that part of the field of thought and action, to which these same individual perceptions and judgments appertain, be framed and delivered.

By general words, a truth, in so far as ascertained by individual observation, may indeed be *expressed*: but, it is not by stringing together general words, be they what they may, or in what number they may, that truth can be *proved*: i. e. that sufficient ground, for regarding any one of these propositions as true—any of the properties in question as really appertaining to the subject in question—can be afforded.

Of the formulary, here proposed in the character of a *test* of *all-comprehensiveness* in the division to which it is applied, what

then is the real function and use?—*Answer.* To point the attention of the reader to the individual matters of fact, on which the possession of this property depends: to point the attention to it, viz. by the means of a pointed form of words, by which the existence of it in all the individual subjects in question is asserted in explicit terms.

That all *living bodies,* (turn here to the Ramean tree, Table V.)—that all *living bodies,* other than those that are *sensitive,* are *insensitive,*—this, for example, is what can be neither denied nor doubted of.—Why? Because the assertion thus brought to view has, in truth, for its subject, nothing more than the import of certain words, compared with certain others:—words, the import of which is on both sides fixt by universal usage.

But that all the *living bodies,* which are called *animals,* are *sensitive,* i. e. possess the property of sensation,—of this proposition the truth depends upon individual observation: viz. partly upon the observation, that bodies, which at first view here supposed to possess sensation, have upon further observation and experiment been found to give further indications of that property; partly upon the observation, that,—in whatever instance body has been found or supposed to be possessed of that same property,—*animal,* and not *plant,* has, of these two correspondently extensive names of classes, been the name to which it has been wont to be referred, as well as the name by which, in common language, it has been wont to be designated.

Of these two observations, the first is an observation relative to the *nature of things;* and the field it belongs to is that of *Natural History:* the other is an observation relative to the *import of words:* i. e. relative to the usage which, among that portion of the human species, by which the language in question has been employed, has obtained in respect of the *things,* or real objects, for the designation of which the *words* in question have been wont to be employed; and the *field* it belongs to is that of *Language.*

It was by fancying that every thing could be done, by putting

together a parcel of phrases, expressive of the respective imports of certain *words*, mostly of certain *general* words, without any such trouble as that of applying *experiment* or *observation* to *individual things*,—that, for little less than two thousand years, the followers of Aristotle kept *art* and *science* nearly at a stand.

In the present instance, what may be seen, is—that, already, in whatsoever may have presented itself in the character of a *demonstration*, among the *data* of it, the existence of the property, the existence of which is the object of such demonstration—the existence of that property in the *subject* in question, viz. in the *division* in question—is virtually assumed. In and by the remainder of the process—in and by the demonstrative part itself—what then is it that *is* or *could be* done?—Nothing more than to shew, that to the two *branches* or *minor aggregates* in question that *formula* is truly applicable, which, wherever it is found to be truly applicable, is received,—or at any rate is fit to be received,—as a compendious *indication*,—and, in so far as the individual assertions included in it are *true*, i.e. agree with the nature of *things* on the one hand and the usage of *language* on the other,—as a commodious *test*, and *provisional proof*, though no more than a *provisional proof*, of the existence of the property in question in the subject in question: viz. in the present instance, of the property termed *all-comprehensiveness* or *exhaustiveness*, in the system of divisions supposed and asserted to be possessed of it.

It is from such truth as there is in the included *particular*—yes and even *individual*—propositions, that whatever truth there is in any more general one is originally perceived,—not *vice versa*. A general proposition is but an aggregate of individual ones: it can only be in so far as the individual propositions contained in it are true, that in the general proposition by which those individuals are contained any truth can be to be found.

The case is—that all *perceptions* are not only particular but *individual*. In so far as it goes beyond actually existing individuals on which the actual observation has been made, every ge-

neral proposition,—how well warranted soever the *induction* is by which it has been formed, how useful soever it is when applied to practice,—and how truly soever the sensation it produces in the mind is different from that produced in the same receptacle by any one of the individual observations of which it contains the assertion,—is still but a figment—the mere figment of the imagination.

Hence—once more, and for the last time—it is only in the character of a *provisional* test that this *general* formulary is presented. In *observation* and *experiment*—observation and experiment having for their subjects *individual* objects—in these are the only *original*, and in case of dispute or doubt, the only *definitive* tests to be found.

To give to mere assertion the appearance, and for that purpose the *name* of *demonstration*, is a contrivance, invented and brought forward, probably without seeing the hollowness of it, by *Aristotle*, and which, down to the present day, either from inability or from unwillingness, to recognize the hollowness of it, polemical writers have not yet prevailed upon themselves to abstain from the use of. The proposition which a man stands engaged to support, is it in its nature a self-contradictory one, and thereby a mere heap of nonsense,—expressive neither of truth nor even so much as of falsehood?—Nothing will serve him but he must give *a demonstration* of it. The more palpable the absence of all genuine instruments of persuasion, the more urgent the demand for fallacious ones.

§ XIII. *Exhaustiveness, as applied by Logical Division—the idea whence taken—Saunderson's Logic—Porphyrian or Ramean Tree—Hermes.*

To the author of these pages, the first object by which the idea of *exhaustiveness*, as applied to *logical division*, was suggested, was a chapter of Saunderson's Logic, which has this operation for its subject. Much about that *same* time, viz. some four and fifty years ago, on the occasion of a set of College-Lectures, in which that book of Saunderson's was employed as a text-book, the copy of it, now lying on the table, received in manuscript a copy of a diagram of a logical tree, therein called *Arbor Porphyriana*—the Porphyrian tree—exactly the state in which it is represented in No. IV. In No. V. it is exhibited with some little alterations, which, on the present occasion, might serve, it was thought, to render it somewhat more readily intelligible.

In this same work of *Saunderson*'s, in a list given of the commentators of Aristotle, the very first place is occupied by this same *Porphyrius*. Yet, useful as it not only is in itself, but more particularly useful as it might have been made, to the purpose of affording exemplification and illustration to some of the instructions contained in that same work of Saunderson's—in no part of that work is any reference to it to be found.*

* From the Greek of the *Isagoge* of *Porphyrius*—i. e. his In-

By every eye, by which this prime and most ingenious example of logical analysis is glanced at, the divisions made by it may at one glance be seen to be, at each step, *bifurcate*. By every one who, in this point of view shall have had the patience to examine into it, it will be found to be at every such step *exhaustive*.

On the subject of *Division*, Saunderson has—for, in following out and paraphrasing the system of Aristotle, he could not fail to have—a chapter. Amongst other rules for the performance of this operation, he requires that it be *exhaustive*—that it possess this property. In that chapter, had it occurred to him to avail himself of the exemplification thus already given of this his own rule, he might have exhibited to his readers a specimen of division, which, being throughout *bifurcate*, is throughout *exhaustive*. In so doing, after causing his readers to observe, that it is *bifurcate*, he might have shewn to them—in the first place, that it is *exhaustive*;—in the next place, that it is by its being bifurcate that it is rendered capable of being proved to be so;—and lastly, that by the mutual contradictoriness of the two propositions, the import of

troduction to the Aristotelian System of Logic—this diagram is supposed to have been translated. But it was the Latin translation, as it stands in No. I.—a Latin translation in manuscript, and not the Greek original in print—that was put by the tutor into the hands of his pupils: nor has it ever happened to this one of them to have ever had a copy of it under his eye.

which is suggested by the pair of denominations presented by each pair of branches, the proof of its being so is actually afforded.*

---

* Since what is in the text was written, an opportunity has been obtained of consulting the work of *Porphyrius*: and the result is—that most improperly has this diagram been ascribed to that wordy and cloudy pre-expounder of a nebulous original.

An edition of *Aristotle's Organon*, (i. e. *System of Logic*) to which is prefixed the Introduction, ascribed to *Porphyrius*, is now on the table: it is that published by *Pacius*, with a Latin Translation, at Frankfort, Anno 1597. In the Greek there is no diagram. In the Latin alone is there any diagram.* But, in the Greek, what is described is—not *a tree*, but a mere *nest of boxes*, one within another. In the Latin diagram, the image presented has in it something of *a ladder*, but nothing at all of *a tree*.

The truth is—what is brought to view by *Porphyrius* is not a system of *divisions*: it is nothing more than a system of *logical subalternation*. Of the materials of the diagram here exhibited, it has not any of the *negative* branches: it has none but the *positive*. Genus Generalissimum, Ουσια: next to and within ουσια, σωμα: next to and within σωμα, εμψυχον σωμα: next to and within εμψυχον σωμα, ζωον: next to and within ζωον, λογικον ζωον: next to and within λογικον ζωον, ανθρωπος. To Grecians it will, without explanation, be manifest enough, how clumsy and incorrect the workmanship is of this *nest of boxes*; how much inferior to that of the *Latin tree*: to non-Grecians, it seems scarcely worth explaining. Thus it appears, that, of this admirable instrument, scarce a trace is to be found in the work of this *Porphyrius*, by whose name it has been found designated. No ramification, no division, is to be found in it: no ramification, consequently no place for that *contradictory formula*, by

* pp. 8, 9.

Planted and firmly rooted, by the logical work of Saunderson, the conception of the necessity of

---

which the relation of the contents of the branches, to one another and to the trunk, is so satisfactorily expressed.

Wonderful, therefore, it is, how, among logicians,—or from the pen of so much as a single logician of the Aristotelian School,—the diagram in question should have been ascribed to this Porphyrius. The probability seems to be, that the inventor of it was no other than *Peter Ramus:* that *Ramus*, whom we have seen, and shall see again, so slightingly spoken of for the use he made of it.

In the text of this section,* when, from the name under which it was handed down, the diagram was concluded to have been the invention of *Porphyrius*, it was mentioned as matter of surprise, that Saunderson had made no use of it. Though the ascription of it to Porphyrius was, as above, the result of misconception, the ground for surprise remains without much alteration. To *Saunderson* the works of *Ramus* were known, for he refers to them. By *Ramus*, what is certain is—that for the bifurcate mode of division a strong predilection was entertained, and abundant use made of it: what seems highly probable therefore, is—that the divisions, thus made by him, either, were, or were intended to be, exhaustive.

According to *Moreri*, (verbo *Ramus)* on the subject of *Logic*, (for he wrote on *Mathematical* and other subjects) the works he wrote were intituled *Institutiones Dialecticæ*, and *Aristotelicæ Animadversiones*, Anno 1543:—his books were condemned, and he turned out of his Professorship, he not being at that time more than twenty-eight years of age. Being the declared opponent of Aristotle, the wonder is how, for that time, he escaped with life.—Being moreover a Protestant, he suffered for

* p. 280.

the property of *exhaustiveness* to an adequate division, received, at a later period, further confirmation, as well as illustration, from the grammatical work of *James Harris*.

Upon reference now made to that work, no such word as *exhaustiveness* or *all-comprehensiveness* have been found in it; but by the word ALL, repeatedly decked out in emphatic capitals, and reinforced by the word *whatever*,—together with the division made of the contents of it, by the words *either* and *or*, the idea was plainly meant to be conveyed, and was accordingly brought to view. Whether in the instance of every one, or so much as any one, of the divisions there exhibited, that quality is given to it, has not, for the present occasion, been thought worth inquiring into. What is certain is —that, for proof of the existence of that quality, neither the *test* here in question, nor any other, is there brought to view. What is also certain is— that, be they as they may in regard to *exhaustiveness*, or say *all-comprehensiveness*,—in regard to *dis-*

---

both sins at once, being comprehended in the Bartholomew-tide Massacre, Anno 1572.

In some of our public libraries, not to speak of private ones, these works of the ingenious Frenchman—Gallicè, Pierre Ramée, Latinè, Petrus Ramus—would be to be found of course. What he found to say against *Aristotle* would at least be matter of curiosity, though, considering at what time of day he said it, probably not of much use.

tinctness, the divisions exhibited in *Hermes* are stark naught.

Under the name of *attributives of the second order, adverbs*—all *adverbs*—are there given as being in their import, *distinct* from the three parts of speech following: viz. from *substantives*, for example *place* and *time*; from *attributives* of the first order, for example the pronoun adjective *this*; and from *connectives*, for example the preposition *in*. Unfortunately — to look no further — in the import of every adverb designative of *place*, and in that of every adverb designative of *time*, may be found the several imports of the three several parts of speech, from the imports of which the import of an attributive of the second order had, in that division of Harris's, been represented as distinct. Adverb of place, *here*; i. e. *in this place*: adverb of *time*, *now*;—i. e. *in* or *at this time*: and so in regard to QUALITY, MANNER, and so forth.*

---

* Some five-and-forty years ago was the discovery of this imperfection made. What led to it was this. Observing that, to the divisions made in that work, the quality of *all-comprehensiveness* was therein ascribed,—and concluding that accordingly, in the contents of it, matter, fit for the being represented as endowed with that quality, would throughout be to be found,—thereupon, by way of exercise, taking the text of it in hand, the author of these pages set himself the task of exhibiting it in the form of a *Ramean* tree: but, not to speak of anterior sources of perplexity, no sooner did the *test* come to be applied to the *attributives of the second order*, than the delusion vanished, and the operation was found to be impracticable.

§ XIV. *Imperfection of the current Conceptions relatively to Exhaustiveness and Bifurcation;—ex. gr.* 1. *in Saunderson's Logic.*

Of the systems of logical division, which, for one purpose or other, are so abundantly framed, and so continually observable, many there are, which, in some of their ramifications, particularly those which are the nearest to the trunk, will be seen to be *bifurcate:* nor can it be doubted, but that of these again a large proportion would, upon the application of the above test, be found to be *exhaustive:* and, lamentable, indeed, it would be, if,—in those arrangements, by which, on all sorts of subjects, men's conceptions are settled and determined,—a property which, by all logicians, has been acknowledged to be the inseparable accompaniment of a good and adequate system of division,—and thence indisputably necessary to a complete and sufficient comprehension of the subject,—were not frequently to be found.

Not very frequently, however, in giving denomination to the component parts of the division, are those names employed,—those correlatives and contrasted names,—by which, as above, the test of plenitude is actually applied.

On this occasion three institutes of logic have been referred to: viz. *Bishop Saunderson's*, in Latin; *Dr. Watts's*, in English; and the view given of

the Aristotelian Logic, by *Dr. Reid*, in *Lord Kaimes*'s *History of Man.*

Of all the views that have ever been given of Aristotle's System of Logic,—concise, nervous, compact, methodical, well-divided—*Saunderson*'s would, it is believed, be found by far the best: several others, which for this purpose were taken in hand, seemed far inferior to it.

In England, at any rate, *Watts*'s, as being in English, and furnished with familiar illustrations, —*Watts*'s, though diffuse, and teeming with anilities, appears, by the multitude of the editions, to have been the most in use.*

Posterior, by a generation or more, to Watts,—as that is by several to the Bishop of Lincoln's,—the view given in the work of *Kaimes* presents in conjunction the authority of two distinguished Scottish writers.

To no one of all these writers does the utility and excellence of the exhaustively bifurcate method, or so much as the use actually made of it in the *Ramean tree*, appear to have made itself suf-

---

* Of all the colleges in the university of Oxford, Queen's College was, in the year 1761,—and, for aught the writer of this has heard, continues to be,—the one, in which the art and science of *Logic* was and is cultivated with most attention. In those days, Saunderson's and Watts's, as above, were,—and, for aught he has heard, continue to be, on this subject,—employed there in the character of the earliest, if not the only institutional writers.

ficiently sensible. By all of them the bifurcate method is indeed mentioned.—Mentioned? But for what purpose? Scarcely for any other purpose than the being slighted. By *Reid* and *Kaimes* it is even taken for a subject of pleasantry: but of pleasantry, (it will perhaps be seen) not very happily applied.

1. First, as to *Saunderson—Lib.* i. *Cap.* 18. *De Divisione.*

After stating, that, on the occasion of *division*, the *whole*, (say rather *the aggregate)*, which is taken for the subject of the operation, is called the *divisum*, (say rather *dividendum)*,—* and that the *parts* into which it is divided—(viz. the *parts* which are the results of the operation) are called the *membra dividentia*, — (he immediately after designates them by the more expressive adjunct *condividentia)* i. e. the *divident* or, more expressively, the *condividents* members,—he proceeds to give his *rules of division:* the rules, in conformity to which, the operation should, ac-

* *Dividendum*, rather than *divisum*, seems to be the more proper term, in so far as the *time*, at which the subject is taken into consideration, is anterior to that at which the operation has been performed upon it: and the first-mentioned is the time which seems to have been in view on the occasion of some of the ensuing rules.—The *dividendum*, not the *dividend*, for fear of running foul of the Threadneedle-street *Bank*.

cording to him, be carried on. They here follow in so many words.

1. *Membra* ABSORBEANT *totum divisum.*—*Let* the *members* absorb—(i. e. include, comprehend, comprise)—the whole of the *dividendum* :—in other words—let the division be *exhaustive.*—Let the division be performed in such a manner, that, if of the parts, which are the result of it, the contents are summed up, in the sum of them, the whole sum of the contents of the dividend will be found.

2*d. Divisum esto latius singulis suis membris ; adæquatum universis.*—Let the *dividendum* be more extensive than each of its members ; *equal,* or say *commensurate,* to all of them put together. After laying down the first, to add, in the character of a distinct one, this second rule, was sad trifling : it shews, as it should seem, that, on this subject, the ideas of the author were far from being clear ones.

Two separate parts does this rule of his include : each of them in its form a distinct rule. But in substance and import, the second part of this second rule is identical with the first rule : and the other part is as obviously as it is necessarily included in both : in the first rule, and in the first part of this same second rule.

To say of *a part* that it is *equal* to *the whole,* would be neither more nor less than a self-contra-

diction *in terminis*—a self-contradictory* proposition.

3. *Membra condividentia sint contradistincta et*

---

* By this unfortunate mass of surplusage, another source of confusion will be seen to be opened.—On the supposition, by which the field for the application of these rules is marked out, a *problem* is proposed. Of this problem the *subject* is supposed to be already determined, viz. the *aggregate*, of which a division is to be made. Upon this subject it is, that, according to this same supposition, an operation is to be performed, viz. that of *division*. Of this operation, when performed, the *condividents parts* or *members* will be the *results*: of which several results the contents will, of course, respectively depend upon the scheme or mode of division, which shall have been pursued. Here then all that is supposed to depend upon the operator, is the *mode* of *the division*, and therefrom the *results* of it: that which, as being, by the supposition, already determined, is supposed *not* to depend upon him, is—the *dividendum*—the aggregate upon which the operation—the division—is to be performed. Of these conditions of the problem, necessary as is the perception and comprehension of them to any clear and correct conception of the nature of the operation and the work, so it is, that by this institutionalist no clear conception seems, on this occasion, to have been entertained. Addressing himself to the operator, the direction which on this occasion he gives is—how to frame his *dividendum*. But, on this same occasion, according to the conditions of the problem, he is not to frame it at all: it is ready framed to his hands.

Upon the whole, what seems evident enough is—that, taken in both its parts, this second rule is worse than useless, and that the complete erasure of it would be an improvement.

opposita: to which, by way of explanation, is added—*ita ut confundi nequeant vel coincidere.* Let the condividend members be contradistinct, (viz. from each other) and opposite: in such sort that they shall not coincide or be capable of being confounded.

By this explanation no very clear light seems to be thrown upon the subject. What seems to be meant is—that, after the division has been made, things shall be in such a state, that of no one of all the several distinguishable articles or masses of matter, contained in the whole dividend, shall any portion be found to lie—part in one of the members, other part in another. In so far as any such incongruity is found to have place, the division, it is evident, is *indistinct,* and, being indistinct, is therefore *imperfect:* the operation has not been completely performed. On the subject of *distinctness* see above, § 12.

4. *Divisio fiat in membra proxima et immediata, et (quam fieri commodè potest) paucissima.* Let the division be made into the nearest and (so far as convenience allows) fewest members. Then immediately after, in the same paragraph, and under this same 10th head or rule, he goes on to say—*A proximis porro ad remotiora et minutiora descendendum per subdivisiones.* From the nearest, (viz. numbers) to those which are more remote and *mi-*

nute (say rather *less extensive*) let descent be made by subdivisions.

In the instance just brought to view, of the second of these rules, the substance of one rule being, in other words, given over again, was given in the character of a distinct and different rule. In the instance of this 4th rule, two rules, perfectly distinct, are confounded under one head, and represented as constituting but one and the same rule. On this last occasion, a new case, or state of things, is brought upon the carpet: viz. the case, in which, by the repeated application made of the operation of division, to the results of a former division, the operations with their results are thus carried on as it were in the form of a *chain*, or rather (as hath been seen) in the form of a *tree*.

Dichotomiæ (he goes on to say) *sunt laudatissimæ, ubi commodè haberi possunt; non tamen nimium superstitiosè et anxiè ubique venandæ; quod faciunt Ramæi.* For division, the dichotomous (i. e. the bifurcate, or two-pronged) mode is most to be commended, when it can conveniently be employed: but it ought not to be every where hunted out too superstitiously and anxiously; as it is by *the Rameans*. In this translation, the expression, it will be seen, is bad enough; and in the original it is still worse. It is composed of a cluster of *tautological*, or (as they are also called) *identical* propositions:—a sort of verbiage, the natural growth

of a weak mind, and of which every mind, that is not a weak one, will, as it values its character, avoid being seen to use. What ought not to be employed, ought not to be employed. On an occasion on which it *ought not*, an instrument of the sort in question *ought not* to be employed. *What ought not to be done, ought not to be done?*—This is the language of a driveller in his dotage.

This instrument, which, at the first mention, is pronounced to be a commendable one,—and of which therefore it cannot but be true that, on some occasions at least, the employing of it is a proper course to take,—what are the occasions on which it is convenient, and thence proper—what the occasion, on which it is not convenient, and thence not proper?—Such are the questions, by the answers to which, and not otherwise, the reproach of *tautologism*,—incurred as it is by the observation, as it stands, might have have been wiped away.

§ XV.—II. *Watts's Logic.*

In his chapter, intituled *Special Rules to direct our Conception of things*, Sect. 8. *Of Division and the Rules of it*,—Watts delivers on this subject a set of rules; of which, according to his numeration, the number is *six*. But in that which calls itself the sixth, may be seen two perfectly distinct ones.

By any thing like a thorough examination of of them, much more room would be taken up

than can here be spared. The fourth, and the last part of the sixth, are the only ones that have any direct bearing on the present point.

1. Let not subdivisions (says the fourth) be too numerous without necessity. Here we have *anility* in a still worse form, than as above in *Saunderson.* Anile tautology patent; self-contradiction latent. "*Let them not be too numerous:*"—this is plain *identicalism* and nothing more: add—"*without necessity,*" the identicalism is now topped by self-contradiction.—Good simpleton! what mean you by the word *too?* Know you then of so much as an imaginable case, in which there is a "*necessity*" that any thing should be "*too*" any thing? in which that which ought *not* to be done *ought* to be done?

2. Lastly, as to that second part of his Sixth Rule—"*Do not,*" says he, "*affect Duplicities, nor Triplicities, nor any certain number of Parts in your Division of Things;*" "*For,*" (continues he, and then come reasons, in which not much application to the subject has been perceived) "*yet* (continues he) *some persons have disturbed the Order of Nature, and abused their Readers by an affectation of Dichotomies, Trichotomies, Sevens, Twelves, &c.*

The section then concludes with another effusion of *anility,* condemning what he calls "a too nice and curious attention to the mere formalities of logical writers, without a real acquaintance with things."

What applies more particularly to the subject here in hand, is—that this division, into no more than *two* parts at each operation, is, in the scale of usefulness, placed by him upon a level, not superior to that of division into any other number of parts: to this or any one number, in comparison of any other, any preference that can be given is equally ascribed to no better a source than *affectation.* Thus what is plain is, that to his *eyes*, as already observed, the matchless beauty of the *Ramean* tree—the test which it affords of exhaustiveness—had not displayed itself.*

§ XVI.—III. *Reid and Kaimes, in Kaimes's History of Man.*

In Lord Kaimes's work, intituled *Sketches of the History of Man*, is contained a "*Review of Aristo-*

---

* From the 5th of these his rules substantial and useful instruction will, however, be found obtainable:—"Divide," says he, "every subject, according to the special design you have in view." Then immediately follows an observation, which, with perfect propriety, might have been made to constitute a distinct rule. "One and the same idea or subject," says he, "may be divided in very different manners, according to the purposes we have in discoursing of it;" whereupon, by way of exemplification, he adduces the several purposes, which, in regard to a book, it may naturally happen to the *Printer*, the *Grammarian*, and the *Logician*, to have in view.—Of this rule of his, two exemplifications may have been observed in the Encyclopædical Table here exhibited.

tle's Logic," which he declares to have received from Dr. Reid. In general, the account there given of that work, is, it may be presumed, correct. But, in the particular passage which now stands for consideration, his Lordship's froth seems, in a dose more or less considerable, to have mixed itself with the phlegm of Dr. Reid.

On this occasion the exhaustive mode came under his review:—he begins with a declaration of its usefulness: he ends with an attempt to turn it into ridicule.

He acknowledges it to be good: but, at the same time, finding the use of it to be attended with some difficulty,—and *that* a difficulty with which he did not feel himself in a condition to cope,—he vows revenge,—and, to accomplish his vow, applies to *Momus*.

Ascribing it, and as it should seem with reason, to the above-mentioned Rameus, he calls it *new*: in that character it becomes fair game for ridicule: and with ridicule it seems to him that he has completely and sufficiently covered it, by a proposal, that, for the purpose of exhaustion, in a series of divisions, carried on in this dichotomous mode, to one of the two members an *et cætera* should in each instance be substituted.

Here then, according to this pair of Logicians, the Latin phrase *et cætera*—in English, *and the rest*—might, on every occasion, and with equal advantage, be substituted to the name of either, or

at least to that of one, of the branches in each joint of a system of logical divisions, framed and denominated in the exhaustively bifurcate mode. But is this so?—No: not on any occasion, with any such advantage. Why not? *Answer.* Because, by an &c. substitute it to which of the two names you will, though you may make your division *equally exhaustive*, you can neither *make sure* of making it *equally distinct*, nor *can* you (see § 12) render it equally *instructive*.

In the name, which, upon the *Ramean* plan, you give to each branch—viz. the *two-worded* name—be it *positive*, be it even *negative*—you bring to view *two properties*: one, in respect of which the individuals contained in the branch in question *agree* with one another; another in respect of which they *differ* from one another: those of the one *having* this latter property, those of the other *not*. But an *et cætera?*—what are the properties of an *et cætera?*

Let it not be said, that the name—the two-worded name—of a *negative* branch, shews no property. For, in the first place, it shews that property, which the individuals belonging to *that* branch possess in common with those that belong to *the other*: in the next place, it shews *another* property: for, to the purpose of instruction, concerning the nature of the object, even the *non-possession* of this or that property, is itself a property.

Under the assurance afforded by the bifurcate mode, when it is declaredly exhaustive—viz. the assurance, that, at each *joint*, in the composition of the two-worded name of either of the two branches, the sign of negation is not actually employed, it may, without impropriety, be so employed at pleasure,—under this assurance, so it is that they may either, or both of them, be employed as trunks, and, in that character, may be subjected to ulterior division. And in this way accordingly it is, that, in several instances, in the annexed sample of an Encyclopædical tree, both branches may be seen employed.—But an &c.?—the phrase *et cætera?*—in what way could these Logicians have made it serve in the character of *a trunk?*—In what way could they have divided it into *branches?*

Of what one sort of aggregate is *et cætera* the name? Yet, according to them, with as much propriety as any given number of other names, an *et cætera*, if repeated that same number of times, is capable of giving denomination to all sorts of aggregates.

By the *contradictory formula*,—which, in every ramification, if performed in the Ramean mode, is, as above, either expressed or implied,—an assurance is given, that the mode of division pursued is meant to be *exhaustive*, and to that end is rendered *bifurcate*. But if, in the instance of either branch, in the room of a significant name the insignificant

name *et cætera* is employed,—in this way, what assurance is given that the mode employed will be bifurcate?—True it is, that, in the case supposed by *Reid* and *Kaimes*, the mode (it seems to be taken for granted) *is* the *bifurcate* mode. But in the nature of their *et cætera*, there is nothing to hinder its being employed when the mode is *multifurcate:* whereas, as hath been seen, it is the property and excellence of the *contradictory formula*—that it cannot be employed but that the mode of division is, at the same time, *bifurcate* and *exhaustive*.

More misconception—more confusion.—Of the confusion made by Watts, for want of his being sufficiently aware, that what belonged to the subject was—not a physical and real whole, but a logical and fictitious aggregate, notice has been taken in § 12. Exactly into that same inadvertence may Reid and Lord Kaimes be seen to have fallen in this place. "*Division of England into Middlesex and what is not Middlesex:*"* this is what they give as an example of the only sort of division here in question, viz. a *logical* one. But, agreeing in this respect with the vegetable body called *a tree*, the portion of the earth's surface, called *England*, is a physical and real whole, not a logical and fictitious aggregate.

In a logical division, performed in the ex-

---

* Kaimes's Sketches, B. III. Sk. i. p. 163.

haustively bifurcate mode, the two-worded name of each branch gives intimation of two properties belonging to all the individuals contained in it: one, in the possession of which they *agree;* another, by the *possession* and *non-possession* of which they are *distinguished.* But, of no one property,—whether as possessed, either by all "*England,*" or by itself, or by any thing that "*is not*" itself,—does the word "*Middlesex*" give any intimation.—"*It is* "*evident*" (say they) that "*these two members com-* "*prehend all England.*"—True. "*In the same* "*manner*" (say they) "*we may divide what is not* "*Middlesex into Kent, and what is not Kent.*" True again. "*Thus,*" (continue they) "*one may* "*go on by divisions and subdivisions* that *are abso-* "*lutely complete.*"—True, once more:—but while, for your subject, instead of a logical aggregate, you take a physical whole, although those divisions will indeed be as trifling and useless as to yourselves they appear to be, being so, will they prove what you bring them to prove?—Not they indeed.—Why?—because they are nothing to the purpose. "This example," (they go on to say) "may serve to give an idea of the spirit of "Ramean division." How far this purpose is really served by it, the reader may now judge.

A curious circumstance is—that it is in the character of a source of objection to this mode, that his Lordship brings to view the train of false "*conclusions*" that, in relation to this subject,

"*philosophers*—ancient and modern"—have, according to him, in great abundance, fallen into.—Fallen into, and from what cause? From the having made use of this security against error?—No: but from their having (says he) omitted to make use of it. To the "*division*" of their making, the fault he ascribes, is that of being "*incomplete*." Of the mode of division, which he is thus holding up to ridicule, the distinctive character is—that it is capable not only of being *rendered*, but, wherever it is so, *proved* to be complete. Yet the mode is (according to him) a bad one.—Why?—because,—*by* pursuing it?—No:—because, *for want* of having pursued it,—certain persons have made bad work.

So much for the objection, which, by this pair of Scottish philosophers, we have seen made to the scheme of logical division, which, in that age of comparative darkness, was invented, as it should seem, by the ingenious French Logician, *Pierre Ramée*.

As to any of those applications which by him (as we are told) were made of it, that at *this* time of day, unless it be from seeing how the instrument itself was managed by him, any useful instruction should be derivable, there seems no great reason to expect.—*Observation* and *experiment*—in these, as above observed, (§ 12) may be seen the only sources of all real knowledge. In the days of *Peter Ramus*, anterior as they were to those of our Lord Bacon, scarcely, unless it were here and there by

accident, had these funds been, either of them, so much as begun to be drawn upon. Of *Logic* with its divisions, all that it is in the power to do is—to arrange and display in the most instructive manner whatsoever matters have been extracted from those sources. What it can do is—to *methodize*; and in that unimmediate way *promote creation*:—what it can *not* do is—*to create*.

§ XVII. *Process of exhaustive bifurcation—to what length may and shall it be carried?*

In the division of a logical aggregate, *exhaustiveness* can never fail to be useful and instructive: to afford assurance and demonstration of its existence, bifurcation can never fail to be necessary. By this time these propositions may, it is hoped, be assumed as truth. There remain however still, on every occasion, two questions:—viz. how far this useful process can be, and how far it ought to be carried on.

By these questions the answers are suggested. Two bars present themselves, by either of which, where it has place, the employment of these instruments may be effectually opposed. One is *impracticability*—the impracticability of the operation: the other may perhaps be termed the *uneconomicalness* of it: being that which has place, where, whatsoever may be the value of the benefit,

the value of *labour* necessarily attached to it—labour of creation, communication and receipt included—would be still greater.

I. As to *impracticability*. Of impracticability, in this case two causes present themselves as capable of having place: viz. *uncognoscibility* and *unexpressibility*.

1. As to *uncognoscibility*.—It is only in so far as the properties, of the aggregates or classes of things in question, are known, that, for the purpose in question, or any other, any one such aggregate, with its branches, can thus be exhibited: this or that property being stated as having place in all the individuals contained in one of the two branches, and as *not* having place in any of those contained in the other. Take, for example, *Natural History*, and therein *Botany*. Forty thousand was, some years ago, stated as the number of supposed different *species* of plants (exclusive of *varieties*) at that time more or less known to the botanic world. But, at that time, the utmost knowledge obtained of them by any person was not, to any such degree clear, correct, and complete, as to enable him, in this way, to shew, of every one of them, in any such concise mode, its points of agreement and disagreement with reference to every other. And even if, in and for any one year, the distinctive properties of the whole multitude of individuals contained in the whole multitude of species then known, could have been exhibited in this systematic form, the

sketch given of them, if with regard to the whole number of species of plants then existing it professed to be, and even if it really were, an exhaustive one, would, in and for the next year, no longer possess that quality.

2. The quantity of *surface* necessary to the exhibition of such a diagram, presents another circumstance, by which, long enough before the number of the extreme branches had reached to any such number as forty thousand, as above—not to say the tenth or the hundredth part of it,—the bar of *impracticability* would be opposed. Number of the extreme branches being 40,000; and this number, being the last term of a series of multiplications in which *two* is the *common multiplier*, what would be the sum required of the number of the intermediate branches, which being to be interpolated between the first term, viz. 1., and the last, viz. 40,000, would be to be added to the sum of those two numbers?—To this question the answer is left to be found by any ready arithmetician, in whose eyes the profit would pay for the trouble.*

II. As to *uneconomicalness*.—To perform the comparatively small number of ramifications ex-

---

* No, (says he), the conditions are inconsistent.—First term 1; Common multiplier, 2; No number of terms will give 40,000 for the last: the two nearest will give—the one a less number, the other a greater. Hence a demand for discussions, the profit of which would not pay for the place occupied.

hibited by the annexed sample, was found to have imposed so heavy a labour, that, over and over again, the thought of having undertaken it has been matter of regret. In comparison of the labour necessary to the execution of such a work, the mere labour of perusing it is obviously a mere nothing. Yet even with this comparatively slight burthen, it is only in the instance of a very small proportion of the whole number of those by whom this volume may happen to be opened, that any expectation of their charging themselves with it can reasonably be entertained.

To those who have inclination and leisure, an assurance is here ventured to be afforded, that whatsoever may be the information derivable from the perusal of a work of this sort, to whatsoever subject applied,—much greater will be the profit derivable in that same shape from the execution of it.

As to the length to which the operation shall be pursued, each individual will in both instances be determined by his own feelings in regard to net profit and convenience. But in one thing all persons, it is supposed, will be agreed, viz. that of the whole number of ramifications, which in this way it might be possible to exhibit, it will in most instances be no more than a part, and that in most instances a small part, of the whole field, that will be found to afford adequate payment for the trouble.

On the other hand, the more extensive the *universal trunk*, the more extensive will be the quantity of information which, in and by each such ramification, will have been obtained and communicated; the more extensive the field, the greater will be the profit derivable from this mode of cultivation.

In the fields of *Noology* and *Ethics* it is, in contradistinction to that of *Somatology* (including Natural History and Natural Philosophy) that the nature of the field will, it is believed, be found to afford the greatest profit. Why? Because, for example, in Natural History, the knowledge of the utmost number of peculiar properties that could in this way be brought to view, would be but inconsiderable, in comparison of the number of such properties as are seen really to have place; and for which,—though in each instance they might be exhibited, as they are actually exhibited in a simple list,—no place could be found in any such Table.

The objects, of which the words that belong to Noology and Ethics are the names, are chiefly the works of man—the products of his mind. In multitude and variety the works produced by this instrument are as nothing in comparison of those produced by the hand of Nature.*

---

* In various parts of the field of art and science, in his own instance, towards giving clearness, correctness, and complete-

§ XVIII. *How to plant a Ramean Encyclopedical tree, on any given part of the field of art and science.*

Having, during a long course of years, and on a great variety of occasions, if his conceptions on this subject are not altogether illusory, derived much advantage from the use of the Ramean tree, the author is unwilling to quit this part of the field altogether, without having first thrown out a few hints, which have occurred to him, as capable of affording more or less assistance, to any other person,* who, on any occasion, may feel inclined to

---

ness to his own views, the writer of these pages has found it—so at least it has seemed to him—of the greatest use. For this purpose he had even brought together a few exemplifications. But, seeing to what a length they had led him from the main purpose, and considering that where, by any person by whom, after such particular discussion and explanation, the reality of the benefit is not recognized in that part of the field which has here been operated upon, still less reasonable would be the expectation of seeing it recognized on any other ground, of which no more than the slightest and most general view could be presented, he struck them out.

Without any such trouble as that of exhibiting them in this particular view, other exemplifications may however, perhaps, be seen to be afforded by some of the subsequent Numbers of this Appendix.

* The reader will probably find a convenience in having open before him the diagram of this *Encyclopedical Tree,* and occasionally to turn to the *Explanations* given, in relation to it, in § 9.

make trial of the old logical instrument, thus newly offered to notice.

1. As far as they go, employ such materials as you find ready provided to your hands. These materials are such words as, in relation to the subject in question, are to be found already existing in the language:—the *words*, and thereby the *relations*, in the designation of which they are respectively employed. Set them down together, one after another, for example in columns, as many as in the first instance you can think of or find, adding from time to time others as they occur.

2. When you have got enough of them to begin upon, whatsoever be the field of which you were then endeavouring to take a survey, among the words the import of which is contained within the limits of it, look out for the one of which the import presents itself as most extensive. See whether it exactly covers the whole extent of the proposed field of your survey. If yes, employ it for your universal trunk: if not, you must frame some word which, by its import, shall, after what explanation may be found necessary, present to view, in the most effectual manner, the whole contents of that same field.

3. The universal *trunk* being thus formed or made, for the first pair of *branches* look out for the two words, the imports of which present themselves as being both of them contained in the trunk, and at the same time the most extensive of

all those that are: applying to them the test herein described, observe whether within their imports, taken together, the whole matter of the trunk be comprehended:—if yes, there is your first pair of *minor aggregates* given—your first *ramification* made.

4. If no two such words can be found, then take the one the import of which—it being, (as it naturally will be), the name of a *positive* property,—appears, next to that of the above-mentioned trunk, the most extensive. Taking this for the name of one of your two minor aggregates—branches of the first ramification—the sign of *negation* added to it gives you the other.

5. The test always in hand or mind, proceed in the same way, carrying on your series of ramification as far as you find convenient: at every joint, for your two branches looking out for a pair of names, both of them in common use: taking up with only one such name, and for the corresponding name adding to it its *contradictory*, in those cases alone, in which no such already existing pair of *trivial*, but at the same time all-comprehensive, names are to be found.

6. For each such branch, if you see occasion, in addition to such its *two-worded* name, framed as last-mentioned, find or frame a *single-worded* name;*

---

* Of a word thus framed, an exemplification may be seen in the *Encyclopedical Tree*, in the word *Eudæmondes*.

which will thus stand as a *synonym* to the just mentioned Encyclopedical two-worded name, and will for ordinary use be a commodious substitute.

7. If, under any trunk, whether by *finding* them or by framing them, you provide yourself, in the first instance, with a pair of single-worded names, —then, for purely Encyclopedical synonyms, you will have to frame for each a *two-worded* synonym: if, in the first instance, the pair of two-worded Encyclopedical names are those with which you provide yourself,—then, for Encyclopedical use, or trivial use, or both, what you will have to do is, as above, to find or frame, as the case may be, one or two *single-worded* synonyms.*

---

* An instance, in which the pair of names first provided were *single-worded* names, and these *trivial* names, is afforded by the words *Geometry* and *Arithmetic*:—an instance, in which the names first provided were indeed *single-worded* names, but those *not trivial* names, but names framed for the purpose, are *Posology* and *Poeology*. From *thence*, by the addition of the name of the *trunk*, were made,—as may be seen both in the diagram and the explanation of it,—the two two-worded Encyclopedical names, *Pososcopic Somatics* and *Poeoscopic Somatics*.

To either of these two Encyclopedical two-worded names, in the structure of which the *contradictory formula* is not expressed but only implied, had it been deemed necessary to substitute two names, in which that *test of all-comprehensiveness* is expressed, the following is the mode in which it might have been effected. *Pososcopic* being continued, to *poeoscopic alegoposic* might have been substituted. In this case, the existence of all-comprehensiveness would have been effected, and that (it is supposed) with

8. On proceeding in this track, what will be very apt to happen to you is—the finding that, —after you have thus found places on your system for a certain stock of appellatives, growing always in number greater and greater, but in point of import each of them less and less extensive as you advance,—a number of appellatives, more or less considerable, the imports of which are more extensive than those of some to which you have given admittance, have been left behind. These imports, however, being, by the supposition, included, every one of them, within the limits of the field which you are thus surveying, will not present to you any new difficulty. By the imports of *these* words, as well as by those of the others, will the field be divisible: only, for the making of your divisions, you must look out for some one or more other *sources*.*

truth. But that *instruction* would not, upon the face of the ramification, have been stampt, which, by exhibiting *Posology* and *Poecology* together, in the character of two branches, comprehending between them the whole contents of the trunk *Somatology*, seems to be afforded.†

* Take an apple. Cut it once through with a knife: by cutting it in this one direction, you divide it into two parts. Put the parts together again, you may in like manner cut it again

† Neither is *quantity* so perfectly out of the question in Natural History and Natural Philosophy, as *quality* is in Mathematics. Scarcely therefore could *Alegoposic Somatology* have been employed as the two-worded synonym of *Poecology*. Here there may be seen an instance of those imperfections which in such a case it seems impossible altogether to avoid.

9. In these cases, as in those first mentioned, these sources will be furnished by so many *distinctive properties:* which accordingly you must be upon the look out for, and for each of which, if it have not a name already, you must make one.

10. Having found or made names for all these several sources of division, set them down one after another in one list: which done, for exhibiting the relation which the objects so denominated bear to one another, you will probably find some means for comprizing, in one and the same system of divisions, the whole list of those *sources of division*, in the same manner as you have comprized in one such system the results of the several divisions from the first of all these several sources.*

11. On looking over the stock of words, belonging to this your field, you will probably find, in a number more or less considerable, pairs or parcels of words, which with relation to one another are *synonymous*. These, as they occur, you will pick up, and, in that character, note them, and set them

---

into two other parts. If those produced by the former division are considered as united, you have still but two parts: if not, you may have four parts. Correspondent to the different *dissections* taken by the instrument of division in the case of this *physical* whole, are the different *sources* of division in the case of the *logical* whole. In both cases the division is equally *bifurcate* and *exhaustive*.

* Of divisional operations, performed on the same subject, from divers sources, examples may be seen in the Table.

down. Examples of words thus related may also be seen in the *Table*.

12. Whatsoever they may be in other respects, it was impossible these directions should be made any thing like complete for use, without some intimation given of the distinction between names of *real entities* and names of *fictitious entities:* a distinction which, in some of his Encyclopedical remarks, D'Alembert was, it is believed, the first to bring to view, and which will be found to pervade the whole mass of every language upon earth, actual or possible. Names of *bodies*, for example, are names of *real entities*;* names of qualities and relations, names of fictitious entities. The names, by which the branches of the *Porphyrean* or *Ramean* tree are designated, are names of *real* entities.† The names of the branches of the Encyclo-

---

* Even by *Bishop Berkeley*, by whom,—as if to out-scepticize the sceptics, and foil them at their own weapons,—the existence of the table he was writing upon was denied,—the *name* of the table would have been allowed to be—in common intendment at least—the name of a *real entity:* and, even in his own view of the matter, the table (an utensil, which required wood to make it of, and a saw, &c. to make it with), would have been allowed to approach somewhat nearer to the state of reality, than a sort of entity, such as a *quality*, as a *relation*, in the making of which *thoughts* have been the only *materials*, and *words* the only *instruments*.

† Say, strictly speaking, names of so many aggregates or classes, of objects *in* which *real entities* are included: for, strictly speaking, *individual* objects are the only real entities: consi-

pedical tree *here* submitted to view, are names of *fictitious* entities: though to a considerable extent included in them, as will be seen, are references made to correspondent names of real entities.

Names of real, names of fictitious entities—in the division thus expressed, may be seen one exhaustive division of the whole stock of *nouns substantive*. Strict, to the highest pitch of strictness, as is the propriety with which the *entities* here called *fictitious* are thus denominated, in no instance can the idea of *fiction* be freer from all tincture of blame: in no other instance can it ever be equally beneficial; since, but for such fiction, the language of *man* could not have risen above the language of *brutes*.

The above seemed as little as could be said, to prevent the whole field of fictitious entities from presenting itself to the eye of the mind in the repulsive character of an absolutely dark spot. More cannot be said, without wandering still further from the main subject, and trespassing beyond hope of endurance upon the reader's patience.

The endeavour to trace out, throughout the whole of their extent, the principal relations between the field of *thought* and the field of *language*

---

dered in themselves, the *aggregates* or *classes* in which those *real entities* are regarded as included, are no more than so many *fictitious bodies*, put together by the mind for its own use. See above, § 12. p. 279. and below, § 19.

—comprising, of necessity, the leading principles of the art and science of *universal grammar*—have been the business of a distinct Essay, which it has been, and continues to be, the wish of the author to include within the limits of the present work. And in that work, in addition to the discoveries, half concealed or left unperfected, by *Horne Tooke*, the distinction, between names of *real* and names of *fictitious* entities, will constitute a capital and altogether indispensable instrument. Almost all names, employed in speaking of the phænomena of the mind, are names of fictitious entities. In speaking of any *pneumatic* (or say *immaterial* or *spiritual*) object, no name has ever been employed, that had not first been employed as the name of some *material* (or say *corporeal*) one. Lamentable have been the confusion and darkness, produced by taking the names of *fictitious* for the names of *real* entities.

In this misconception may perhaps be found, the main, if not the only source, of the clouds, in which, notwithstanding all their rivalry, Plato and Aristotle concurred in wrapping up the whole field of *pneumatology*. In the phantoms generated in their own brains, it seemed to them and their followers that they beheld so many realities.

Of these fictitious entities, many will be found, which,—they being, each of them, a *genus generalissimum*,—the names are consequently incapable of receiving what is commonly understood

by a *definition*, viz. a definition *per genus et differentiam*. But, from their not being susceptible of *this* species of *exposition*, they do not the less stand in need of *that* species of exposition, of which they are susceptible.*

By any person—should there be any such person—to whom the ideas thus hazarded, present themselves as having a substantial footing, in the creation of *things* on the one hand, and the nature of *language* on the other,—it will probably be admitted, that a demand exists for an entirely new system of *Logic*, in which shall be comprehended a *theory of language*, considered in the most general point of view. For the construction of such an edifice, a considerable proportion of the *materials* employed in the construction of the *Aristotelian* system of logic, would be indispensably necessary. But in this very supposition is included the necessity of *taking to pieces* the whole mass of that most elaborate, and, considering its date, justly

---

* Examples of these *undefinable* fictitious entities are—

I. Physical fictitious entities—*motion, rest, quality*, &c.

II. Ethical fictitious entities—*obligation, right, power*, &c.

III. Ontological fictitious entities—*condition, certainty, impossibility*, &c.

Of the demand for a *species* or *mode* of *exposition*, adapted to the nature of this class of appellatives, hints may be seen in an anonymous tract published by the author, A° 1776, under the title of "*Fragment on Government*," &c. p. 179 to 185. It has this long time been out of print.

admired and venerated monument, of human industry and genius.

As to *Plato*, when in the vast wilderness of words with which, by this spoilt child of Socrates, so many shelves and so many brains have been loaded, and in which so many wits, beginning with those of Cicero, have been lost,—when among all these *signs*, so much as a single thought, which is at once clear and instructive, shall have been pointed out, it will be time enough to steal from the examination of Aristotle's Logic, either a word or so much as a thought, to bestow upon his master's eloquence.

With some modifications, which reflection will suggest, and which it would take up too much time and room here to endeavour to particularize,—the method herein above proposed, as applicable to *names of* objects,—to those elementary parts of *propositions*, which by logicians are distinguished by the name of *terms*,—would be found applicable to *propositions* themselves:—to those propositions, for example, by which, under some such name as *Contents*, intimation is given, in general expression, of the matter contained in any literary work, and more particularly in any work of the *institutional* kind: and thus it is, that to the view taken of any such portion of the field of art and science, may be given, in the promptest and most commodious manner, any degree of extent of which the existing state of the materials, collected by observation and

experiment, has rendered it susceptible: and in truth,—*terms* being the matter of which *propositions* are principally composed,—by any arrangement given to those principal ingredients, an arrangement is already in some sort given to the whole matter of all the several propositions, into the composition of which those elementary articles are capable of being made to enter.

In the explanation above given, of the manner in which, out of such terms as, in any given part of the field, the existing state of the language furnishes, a system of exhaustively bifurcate division may be formed,—it has been seen how it is that, in a number of places more or less considerable, for want of such names, already in use, gaps will be left in the work: gaps, for the filling up of which, instructions are thereupon given.

By the powers of the imagination, working with *analogy* for its instrument as well as its guide, *words*,—especially where, in some orderly manner, spread out, a number of them, together on one and the same surface, before the eye,—will bring to view, each of them, not only the particular object, which in common discourse it is employed to designate, but an indeterminate multitude of other objects, which, by means of some *relation* or other, stand, each of them, in some way or other associated with it. In this way it is, that by means of some indication, afforded by the import of this or that article belonging to the existing stock of

names, the filling up of a gap of the sort just described will be effected: and by every gap thus filled up, precision at least, and frequently *extension*, will, if the operation be properly performed, be given to the conception entertained of the contents of that part of the field:—and thus may be seen, according to the nature of the branch of art and science which is in hand, one way at least in which *inventions* may be, and doubtless have been brought to light, and *discoveries* made. *Quodlibet cum quolibet*—is a motto that may serve for every discovering, and every inventing mind.

§ XIX. *Logical Mode of Division—its Origin explained and illustrated.*

For facilitating the execution of a work of the sort here in question—viz. a system of logical division in the exhaustively bifurcate mode—a few instructions, such as they have been seen, have just been hazarded. The topic was upon the point of being closed, when, by a dip taken into Condillac's little work on *Logic*, an addition was suggested, which now seemed indispensable. The only sort of *analysis*, which in the present work hath as yet been in question, is of that sort, of which not so much as the conception could have presented itself, but in a considerably matured state of the human mind. But in that little work of Condillac, under

the same name *analysis*, was observed to be brought to view a sort of logical operation, to which that appellation could not, it seemed, with propriety, be refused, but of which it was at the same time evident, that it could not but have been in use in the very earliest stage of human existence: a stage so early, that although the operation must, in its extension, have kept pace with that of language, yet in part the existence of it must have been anterior even to that of the earliest formed raw materials, of which language was gradually composed: since those materials are not, any of them, any thing but signs of ideas, and it is only by the sort of analysis now in question—viz. the *primæval logical analysis*, performed by the mind upon individual objects in the character of physical wholes, that those ideas were supplied.

Of every *logical analysis*—of every system of logical divisions—the subject is a *logical whole*. But, any such logical analysis, no where could it ever have had a subject, but for that system of *primæval* logical analysis, which has had for its subjects *physical wholes*, and for its *results* those ideas, which at the very moment of their conception, were respectively accompanied and fixed by so many *names* or *denominations*:—signs, by means of which, in so far as those signs were the sort of names called *common* names, those ideas were as it were tied up into bundles, called *sorts*, *kinds*, *species*, *genera*, *classes*, and the like: the connexion being effected

by another sort of logical instrument, which, as will be seen, is not *analysis*, but its converse, *synthesis*.

Of this double course—a course of *analysis*, conjoined with a correspondent course of *synthesis*—the commencement must have had place in the very infancy of society: and neither to the continuance nor to the extension of it can any conceivable bounds be assigned, other than those which apply to the extension and continuance of society itself.

1. Difference between a *physical whole* and a *logical whole*—2. difference between *physical analysis* and *logical analysis*, when both have for their subject a *physical whole*—3. difference between logical *analysis* and logical *synthesis*—4. operation and instrument by which *logical synthesis* is performed—5. necessity of an antecedent logical *analysis*, performed upon a physical whole, to the previous *formation*, and thence to the subsequent *analysis* of a *logical whole*—6. necessity of an act of logical *synthesis* to the formation of such logical whole—such are the points, on all which, as soon as the definitions of the two species of *wholes* have been given, a conjunct illustration will be attempted.

By a *physical whole*, understand any *corporeal real entity*, considered as being in one mass, and without any regard paid at the instant to any parts that might be observable in it: for instance, this or that individual *plant*.

By a *logical whole*, understand that sort of fictitious *aggregate*, or *collection* of objects, for the designation of which any one of those names, which, in contradistinction to *proper* names are termed *common* names, are employed: for example, the aggregate designated by that same word *plant*. The common name *plant* is applicable to every individual plant that grows: and not only to those, but moreover to all those which ever grew in time past, and to all those which will grow in time future: and in saying, of any one of them individually taken—viz. of those that are now growing, *this plant exists*, there is no fiction. But the *aggregate*, conceived as composed of all plants, present, past, and future put together, is manifestly the work of the *imagination*—a pure fiction. The *logical whole*, designated by the word *plant*, is therefore a *fictitious* entity.

For the illustration of these several points, follows now a short history, which though at no time perhaps realized in every minute particular, must many millions of times have been exemplified in every circumstance, which, to the purpose of the present explanation, is a *material* one.

Walking one day over his grounds, a certain husbandman observed a plant, which was not of the number of those which he was employed cultivating. Overhanging some of them, it seemed to him to impede their growth. Taking out his knife, he cut the plant off just above the root: and

a fire, in which he was burning weeds for the ashes, being near at hand, he threw it into the fire. In so doing, he had thus in two different modes performed, upon this physical *whole*, the physical *analysis*. By being cut as it was, it became divided into two parts, viz. the *root*, and that which was above the root: and thus in the *mechanical* mode was the physical analysis performed upon it. By its being thrown into the fire and there consumed, of the portion so cut off as above, part was made to fly off in the state of *gas*, the rest staid behind in the state of *ashes*:—and thus in the *chemical* mode was the physical analysis performed upon it.

Not long after, came a daughter of his that same way, and a plant of the same kind which her father had thus cut down being left standing, her *attention* was caught by the beauty of it. It was a sweet-brier rose, of which one flower had just expanded itself. All parts of the plant were not alike beautiful. By one part her attention was more forcibly engaged than by the rest. It was the flower. To examine it more closely, she plucked it off, and brought it near her eye. During its approach, the scent of it became perceptible: and thus another sense received its gratification. To prolong it, she tried to stick the flower in a part of her dress that covered her bosom. Meeting with some resistance, the stalk to which, with a few leaves on it, the flower was attached, was some-

what bruised; and now she perceived and distinguished another odour, which though not less agreeable, was somewhat different from the first.

All this while she had been performing upon this physical whole the logical operation termed *logical analysis*:—performing it not the less; though, as in *Moliere's Bourgeois Gentilhomme* Monsieur Jourdan when talking *prose*, without knowing it. The *instrument*, by which this mental *operation* was performed by her, was the fictitious entity *attention*. By the attention which she bestowed upon the flower, while no equal degree of attention was bestowed upon any other part of the plant, she analyzed it—she mentally *resolved* or divided it—into *two* parts, viz. the *flower*, and all that was not the flower: and thus she distinguished part from part.

Again. By applying her attention, first to the *beauty* of the flower, composed as it was of the beauty of its *form* and the beauty of its *colour*, she performed in this same original subject *another* analysis, which though still a *logical* analysis, was productive of results somewhat different from those produced by the former: for thus, in the same *part* she distinguished two *properties* or *qualities*; viz. that of presenting to the sense of *sight* a peculiarly agreeable *appearance*, and that of presenting to the sense of *smell* a peculiarly agreeable *odour*. The *parts* were both of them *real* entities: the *qualities* were, both of them, *fictitious* entities.

Eager to communicate the discovery to a little

brother of her's, she took him to the spot: she shewed him the *plant* from which the flower had been plucked. The flower had already become a subject of conversation to them: that part had already received the name of *flower:* not having equally engaged her attention, the other part, like a sheep in a flock, or a pig in a litter, remained without any distinctive name.

Ere long her sweet-brier rose put forth two other blossoms: being so little different from the first, each of these became *flowers* likewise. From a *proper* name, *flower* thus became a *common* name.

In the course of another social ramble, a *mallow* plant, with a flower on it, met her eye. At a distance the flower was not yet distinguished from that of the *sweet-brier rose*—"*Ah,*" (cried she), "*here is* flower *again.* The *sweet-brier,* on account of its scent, which continued after the flower was gone, had been preserved: the *mallow,* having nothing but colour to recommend it, was neglected.

These rambles had not continued long, before other sweet-briers and other mallows met her eye. The former being regarded with interest, the other with comparative indifference, the occasion for distinguishing them in conversation was not unfrequently recurring. The *rose flower* became a *rose flower,* the *mallow flower* a *mallow flower.*

When the flower first observed was named *flower,* as yet nothing but *analysis—logical* analysis—had

been performed:—no operation of the nature of logical *synthesis:* of one individual object it was and no other, that the word *flower* had been made the name.—But, no sooner was the *second* flower observed, and the same name *flower*, which had been applied to the first, applied to this other, than an act of logical *synthesis* was performed. The *proper* name was thus turned into a *common* one; and the fictitious entity, call a *sort*, a *kind*, a *species*, or a *genus*—(call it which you please) was created.*

The *fictitious* entity being nothing at all, and the two *real* entities being each of them something, the *fictitious* entity itself did not contain within itself the two *real* entities, or either of them. But the name,—which, after having occasionally been applied to each of the two *real* entities, became, by degrees, designative of the *fictitious* entity deduced from them, as above, by abstraction,—continued to be employed for the designation of *either* of them, and occasionally for the designation of *both* of them together: and thus,—in a sense, which,

---

* *Genus* and *species* are words, which cannot, either of them, be employed without impliedly asserting the existence of the other. Both are aggregates, or names of aggregates: *genus* is the whole, of which *species* is a part. Suppose but *one* aggregate, either of these names may as well be applied to it properly as the other; or rather, and for the above reason, neither can with propriety be applied to it.

although not strictly proper, has the advantage of conciseness,—the one *fictitious* entity—the *species*—may be said to have contained, and to contain, the two individual *real* ones: to *contain*—viz. though not in a *physical*, in a *logical* sense.*

---

* Thus it is, that, considered as distinct from the individuals contained in them, these aggregates, as above, are but *fictitious entities*:—the *names*, employed in the designation of them, so many *names of fictitious entities*. But, when compared with names of fictitious entities at large, these may be seen to have something peculiar in them, which, if he would avoid confusion and disputation, it seems necessary a man should have in mind. In this case, the same word which is employed to signify the *fictitious entity*, viz. the *fictitious aggregate*, is also employed to designate any one of the *individual real entities*, of which that aggregate is regarded as being composed: an homonymy, which may be seen not to have place in the instance of any other sort of fictitious entity, such as a *quality*, a *property*, a *relation*, and the like. Nor let it be said, that, because it contains real entities, the aggregate, called a *species*, a *genus*, a *class*, is itself a real entity. For by the word *plant*, taking *plant* for example for the aggregate, are designated—not only all plants existing at the time of the speaking, or the writing of that word, but also all plants that ever have existed,—and all plants that ever shall exist in future,—and even all plants that, without existing, shall be but conceived to exist: and to these last, at any rate, the term *real entity* will hardly be regarded as properly applicable. But, though, in addition to the several individual objects, to which the word *plant* is applicable, no real entity, corresponding to it, has place *out* of the human mind,—yet, *within* that receptacle, by this same *name* of a *fictitious* entity, a *real entity*—a *general idea*,—an entity, which though not *corporeal*, is not less *real* than that which is produced in it by the sight or touch of an individual plant,—is produced.

To

The analysis thus unconsciously performed by the maiden on the first-observed sweet-briar rose—

To convince himself of this, the reader need but ask himself—whether, after, and by thus reading the word *plant*, his mind is not put in a state more or less different from that which it was in, before this word was read by him. If this be not enough, then let him say, for example, whether by the proposition, *plants have a property which minerals have not*, three distinguishable mental sensations at least—not to speak of any others—have not been produced in his mind: three perfectly distinct *ideas*, each of which is of that sort which is termed a *general* or *abstract* one. Yet, to some philosophers, it has, somehow or other, been matter of supposed discovery, that there are no such things as general or abstract ideas: not considering that, if this position of theirs were true, nothing that they say in proof of it would have so much as the least chance of being productive of the effect they aim at: or, to speak still more generally, scarcely would any thing they say be productive of any more effect than would be produced by so much nonsense. Yes:—by the word *plant*, or the word *plants*, when read, an effect, a sort of *feeling*, or *mental image*, is as really produced, as by the sight of any individual plant,—and it is a clearly different one. In the one case it is an *abstract idea*; in the other case, an *impression*: but in the one there is just as much reality as in the other. Of the evidence of the existence of the general idea, the probative force is even nearer, and more promptly and surely satisfactory, than that of the existence of any individual *plant*, from which, by abstraction, that general idea was deduced. In the former case, the evidence is *perception*: in the other case, it is but *inference —ratiocination*: and *that* such ratiocination, as many an acute mind (Bishop Berkeley's for instance) has not been satisfied with.

In speaking of *genera* and *species*, two sources of indistinctness and confusion, and (if observed) of perplexity, are continually

viz. by applying her attention to one part, while it was not applied to the other—had for its subject the *real* entity—the physical whole. It may be termed, the *primæval* or *primordial* analysis: for by no other sort of logical analysis will it be found capable of having been preceded.—The analysis, by which the rose-flower became *rose-flower*, and the mallow-flower, *mallow-flower*, had for its subject no other than the *fictitious* entity—the *logical* whole —viz. the *whole* designated, fixed, and, as it were, created, by the denomination *flower*, so soon as, after having been employed merely as a *proper* name, it had come to be employed as a *common*, and thence as a *specific* or *generic* name.—It

---

presenting themselves. One is—the difficulty which, on the appearance of a generic or specific name, is found, in determining whether it is the fictitious entity—the aggregate *itself*—, or only the *name* employed for the designation of it—that, in the character of the subject of the proposition, the word is intended to bring to view. The other is—the penury and imperfection, under which language—the best constructed not excepted—still labours: viz. in respect of its furnishing no more than these two names, for the designation of the results of any number of ramifications, which, in a system of logical division, there may have been occasion to bring to view. Hence it is, that the same word, which, with reference to this or that other is a *generic* term, is *specific* with reference to a third. Hence again the continually recurring question—is this a *generic* or a *specific* name? and the dispute, with what that question is pregnant is altogether an interminable one.

may be termed the *secondary* analysis, or analysis *of the 2d order*. In her young mind, and in this its simple form, this secondary mode of analysis had nothing in it of science—nothing of system. But, in it may be seen the germ of all those systems of division, which, being framed by scientific hands, have spread so much useful light over every portion of the field of art and science.

The maiden had for her sweetheart a young man, who, though not a member of the Company of Apothecaries, (for the company had not yet received its charter) had, on his part, been engaged in a little train of observations, to an improved and extended series of which, together with the experiments which they suggested, some thousands of years afterwards, that most useful and respectable community became indebted for its establishment.

He had observed his dog, after a full meal, betake itself to a grass-plat, and gnaw the grass: a sort of article which, when hungry, it had never been seen to meddle with. To this sagacious swain the maiden was not backward in reporting her above-mentioned discoveries. It might, perhaps, have been not altogether impossible to obtain a communication of some of those observations and discoveries of his, for the purpose of adding them to hers. But, for the explanation of what has here been endeavoured to be explained, what

has already been reported of damsels, will, it is hoped, be found to suffice, without any further trial of the reader's patience.*

---

* In their present shape, the conceptions above brought to view would not have been formed, nor consequently would this section have been penned, but for a very recent glance cast on the *Logic* of *Condillac*. More than once, at different times, had that little work been glanced over, or at least glanced at: never without its presenting itself in the character of a mass of confusion, from which little or no information was to be reaped. *Analysis* is the name there given to the instrument, by which every thing is there supposed to be done: every thing by that *one* instrument; in every case that one instrument the same. Language-making was *analysing*: and "*analysis* itself was but a *well-made language*." (pp. 88, &c. 121, &c.) On looking at the work once more, observation was made of such passages, in which —always under this one name, *analysis*—an explanation is given of the mode, for the distinguishing of which the epithet *primæval* has herein-above been just employed. Now, for the first time, presented itself to view, matter which seemed capable of being put to use. A resolution was accordingly taken, to endeavour to derive such instruction as might be found derivable from it. Its claim to *attention* being now recognized, thus it was that, by a closer application of that faculty, those distinctions, which have above been seen, were brought to view. *Logical analysis* of the *physical whole*, *logical synthesis*, performed upon the *qualities* upon the *parts* which had been produced by that logical *analysis*—these,—together with the *logical analysis* of those aggregates which were the products of that *logical synthesis*, —were, in the logic of Condillac, seen all of them designated by, and confounded together under, the one undiscriminating term *analysis*.—For the subject of the *primæval* analysis, Condillac, before he came to the *plant*, had employed a magnificently furnished *Château*: for the present occasion, a couple of plants

Some thousands of years after appeared *Linnæus*. In the course of that interval, not only in the lan-

---

seemed quite sufficient, without any such incumbrance as the *Château*. Moreover, of the sort of work here in question, abundance must have been done, before there were any such things as *Châteaux*.

Yes, (says somebody); and so there was before husbandmen's daughters amused themselves with gathering flowers. The ancestors of husbandmen were shepherds; the ancestors of shepherds, hunters. In certifying this genealogy *Geography* joins with History.

Assuredly (it may be answered) man had need to provide food, before maidens had need to gather flowers. But, to provide food, man must, somehow or other, have been in being, and able to provide it. Here then the explanation would have been entangled in the mysteries of *Cosmogony*—a subject, which, besides its inexplicability, is altogether foreign to the present purpose. No doubt that, for *attention*, and thence for *analysis*,—to be performed, as above, upon these *physical wholes*,—and thence for *synthesis*, and thence for *logical analysis*, to be performed upon the *logical wholes*, results of these *logical syntheses*,—demands much more urgent, as well as much more early, must have been produced by eatable *fruits* and *roots* than ever can have been produced by *flowers*. But, by any such illustration, we should have been sent to the Garden of *Eden*: and of that garden no map being to be had, sufficiently particular for the present purpose, there we should have lost ourselves.

Pluming himself, as it should seem, upon the discovery, and bringing it to view as such thrice in two small 12mo. pages, *Condillac* (pp. 114, 115) will have it, that languages are but so many *analytic methods—methodes analytiques*: meaning, as far as he can be said to mean any thing, the results of so many analytic—purely analytic—processes. He sees not, that, so far from being an analytic process, the process, by which the prin-

guage in which he wrote, but in every lettered language at least, not indeed with perfect steadi-

---

cipal and fundamental materials of all languages—viz. *common* names—are framed, is of a nature exactly opposite to that of *analysis*; viz. *synthesis*. True it is, that this *synthetic* is necessarily preceded by an *analytic* process: viz. by the one above explained under the denomination of the *primæval* or *incrudite* analysis:—a *logical* analysis performed upon *physical wholes*. True it also is that, to the *wholes*, which are the results of this synthetic process,—with the exception of those *minimums*, which are in immediate contact with individuals,—another analytic process may, to any extent, be applied, viz. the scientific or *logical* analysis, performed upon these logical wholes. But, how promptly soever they may succeed to each other, *disaggregation* and *aggregation*—putting asunder and putting together—never can be one and the same operation—never can be other than opposite operations: and, but for and by means of the aggregative process, not a single word—not a single instrument—would the philosopher have had, wherewith to put together this his not sufficiently considered account of the formation of language.

One of these days—the sooner the better—by a still closer application of the faculty of *attention*, a more discerning eye will, perhaps, discover and bring to light similar imperfections in the account given of the matter in these pages: and thus it is, that,—by still closer and closer application of that same faculty,—additional *correctness*, *distinctness*, and *comprehensiveness*, is given to man's conceptions, in relation to each and every portion of the field of art and science.

Of the aggregations thus formed, some have been better made, others worse. Those which he regards as having been better made, were (he assures us) the work of *Nature*: those which were worse made, the work of learned men: meaning such whose labours in this line he saw reason to disapprove of. *Nature* being a sort of goddess—and that a favourite one—by ascribing to

ness, but still without much dispute or variation, a name corresponding to the word *plant* had been

---

this goddess whatsoever was regarded by him as good, he seems to have satisfied himself, that he had proved the goodness of it: and, by so concise an expedient—an expedient, in the employment of which he has found but too many successors, as well as cotemporaries and predecessors—he has saved himself no small quantity of trouble.

Nature is a sort of fictitious personage, without whose occasional assistance it is scarce possible (it must be confessed) either to write or speak. But, when brought upon the carpet, she should be brought on in her proper *costume*—nakedness: not bedizened with *attributes*—not clothed in *eulogistic*, any more than in *dyslogistic*, moral qualities. Making minerals, vegetables, and animals—this is her proper work; and it is quite enough for her: whenever you are bid to see her doing *man*'s work, be sure it is not *Nature* that is doing it, but the *author*, or somebody or other whom he patronizes, and whom he has dressed up for the purpose in the goddess's robes.

One word more, on the subject of a former topic, before this philosopher is parted with.—In § 7. p. 143, may be seen the result of the provisional attempt towards an enumeration of the distinguishable *operations*, and correspondent *faculties*, of the mind. In number they were *seventeen*: *Condillac* (ch. 7. p. 61) makes but *six*: viz. 1. Attention. 2. Comparison. 3. Judgment. 4. Reflection. 5. Imagination. 6. Ratiocination. It might be an exercise for a student—nor would it surely be an unuseful one—to compare these six with those seventeen:—to observe, whether, in this longer list, there are any articles that do not properly belong to it:—and if not, whether *Condillac*'s shorter list be, in any particular, defective or not:—whether, for example, *memory* has not been *forgotten* by him:—and if not defective, in which of the articles of his shorter list those of the longer list are respectively comprized.

On

in use to be employed in the designation of any one of those physical objects, to which, when individually taken, that same denomination continues to be applied.

For the same length of time accordingly, a *logical whole*, possessing this vast extent—a *logical whole*, formed by the logical process called *synthesis*

On considering the catalogue once more, it seems as if some such article as *analogization* or *analogoscopy*—i. e. *observation of analogies*, might form a useful addition to it. Not but that, in the explanation thus given, the phrase *observation of analogies* is already to be found. But,—so distinct from *simple abstraction*, *analysis*, and *comparison* are those abstractions, analyses and comparisons, which have *observation of analogies* for their result,—and so powerful and perhaps indispensable an instrument is the faculty so denominated in the hand of *Invention*,—that a separate denomination would, it should seem, be not ill bestowed upon it. Note, that to the above catalogue of the distinguishable operations and correspondent faculties of the human mind, the so-often-mentioned *test* of distinctness and all-comprehensiveness has not been applied. It is the result of no other operation than the analysis above distinguished, by the name of the *primæval* analysis: and (unless the title by which it is thus designated be regarded as the result of an act of *synthesis*) not subjected to any synthesis; nor consequently to any *scientific* analysis, as above distinguished.

Hence it cannot be given in any other character than that of a collection of raw materials, not so much as attempted to be made up into a finished work. The task was too heavy to be attempted in a parenthesis. But if, in the materials thus brought together, any addition should be found made to those which had already been brought together by other hands, it will be not altogether without its use.

—had been in possession of the sort of existence which the nature of an object of this sort admits of.

For the purpose of distributing,—according to such of these properties, as were at the same time most easily observable, most steady in their union, and most interesting to man, whether in the way of use or harm,—such individual plants as from time should come under observation,—and *this* to the end that such names might be given to them, whereby, for the purpose of putting to use their useful properties, or excluding the operation of their pernicious properties, they might, when seen, be recognized,—various sources of division had occurred to various scientific observers. By none of them had this useful object been completely accomplished. To *Linnæus* it appeared, that it was in the *flower* that the most apt source of division was to be found: inasmuch as, for the determination of the principal and most comprehensive divisions of a vast logical whole, certain differences, in respect of the form in which that part manifests itself, might be made to serve with as yet unknown advantage.—Why?—Because, with those differences in respect of the flower, other differences in respect of some of the properties most interesting to man—differences pervading the entire mass of each individual plant—had been observed to be conjoined. Thence, by seeing what sort of a thing the plant in question is, in respect of the

flower, a guess may be formed, better than can be formed by any other means, what sort of a thing the plant is in other respects.

From this view a conception may be formed, of the disadvantage, under which every system of logical division comes to be framed. In this way no two things can be put asunder, but what have first been put together. To no other objects can this mode of *analysis* be applied other than to *logical wholes*—objects which are altogether the product of so many antecedent logical *syntheses*. But, in the first place, the *primæval logical analysis*, performed upon individual objects — this process, notwithstanding this its scientific name, having taken its commencement at the very earliest stage of society, cannot but have had for its operators the most unexperienced, the most uninformed, and unskilful hands. In the next place, the *synthetic process*,—by which the results of that analysis — fragments detached, by abstraction, from these physical wholes—were placed as it were under so many different common names, and by those names bound together by so many logical ties,—this likewise was a work, which, though not yet concluded, nor in a way to be soon concluded, must in its commencement have been coæval even with that of the *primæval* process, to which it has been indebted for all the materials on which it has had to operate: coæval with the very first crude effusions, of the results of which the matter of spoken,

and thence of written language, came, by continual additions, to be composed.

Thus stands the matter, in regard to those names of aggregates, in the signification of which are comprised such individual objects as are purely corporeal.—How then stands it (says somebody) in regard to objects of the *pneumatic* cast, *real* and *fictitious*?—The answer is—to apply to this division of the objects of thought the triple process, just above described, would require a full and detailed explanation of the nature of those *fictitious* entities, which, by reason of the similarity of the aspect of their names to that of the names of corporeal objects, all which names are *real* entities, are so continually confounded with real ones. But to suggest the question is almost all that can be done here. To attempt any thing like a complete answer, would be to transgress beyond endurance the proper limits of this work. A few words, for the purpose of affording an indication, how faint soever, of the only track, by the pursuit of which, a satisfactory answer would, it is supposed, be to be found, may be seen in the concluding note.*

---

* According to that conception of the matter, which is here alluded to and assumed, entities are either *real* or *fictitious*: real, either *perceptible* or *inferential*; perceptible, either *impressions* or *ideas*; inferential, either *material*, i. e. *corporeal* or *immaterial*, i. e. *spiritual*. Material are those of which the principal divisions are exhibited in the *Ramean* tree: of such inferential real entities as are immaterial, examples may be seen in the Almighty Being,

and in the human soul, considered in a state of separation from the body.

By *fictitious entities* are here meant—not any of those which will be presented by the name of *fabulous*, i. e. imaginary *persons*, such as *Heathen Gods*, *Genii*, and *Fairies*, but such as *quality*—*property* (in the sense in which it is nearly synonymous to *quality*)—*relation*, *power*, *obligation*, *duty*, *right*—and so forth. Incorrect as it would be, if the entities in question were considered as being, in point of reality, upon a footing with *real* entities, as above distinguished,—the supposition of a sort of *verbal* reality so to speak, as belonging to these fictitious entities,—is a supposition, without which the matter of language could never have been formed, nor between man and man any converse carried on other than such as hath place between brute and brute.

Fictitious as they are, entities of this description could not be spoken of at all, if they were not spoken of as *real* ones. Thus a *quality* is spoken of as being *in* a thing or a person: i. e. the thing or the person is spoken of as being *a receptacle*, and the *quality* as being something that is contained *in* it.

As in the case of all words, which have an immaterial, as well as a material, the root of the *immaterial* will be found in the *material* import,—so, to explain the nature and origin of the idea attached to the name of a *fictitious* entity, it will be necessary to point out the *relation*, which the import of that word bears to the import of one or more names of *real* entities: i. e. to shew the *genealogy*, or (to borrow an expression from the mathematicians) the *genesis*, of the fictitious entity.

From the observation, by which, for example, the words *duties* and *rights* are here spoken of as names of fictitious entities, let it not for a moment so much as be supposed—that, in either instance, the reality of the object is meant to be denied, in any sense in which in ordinary language the reality of it is assumed. One question, however, may be ventured to be proposed for consideration—viz. whether, supposing no such sensations as

pleasure or *pain*, *duties* would not be altogether without *force*, and *rights* altogether without *value*?

On this occasion, in the case of the name of a fictitious entity, a distinction requires to be made between the *root* of the *idea*, and the *root* of the *word*, by which it is designated. Thus, in the case of *obligation*, if the above conception be correct, the root of the *idea* is in the ideas of pain and pleasure. But the root of the *word*, employed as a sign for the designation of that idea, is altogether different. It lies in a material image, employed as an *archetype* or *emblem*: viz. the image of a *cord*, or any other *tie*, or *band*, (from the Latin *ligo*, to bind) by which the object in question is *bound* or fastened to any other—the person in question bound to a certain course of practice.

Thus, for the explanation of a fictitious entity—or rather of the name of a fictitious entity—two perfectly distinct species of operations—call them *paraphrasis* and *archetypation*—will, in every case, require to be performed; and the corresponding sorts of propositions, which are their respective results, formed: viz. the *paraphrasis*, performing the function of *a definition*, but in its *form* not coinciding with any proposition to which that name is commonly attached.

The *paraphrasis* consists in taking the word that requires to be expounded—viz. the name of a *fictitious* entity—and, after making it up into a *phrase*, applying to it another phrase, which, being of the same import, shall have for its principal and characteristic word the name of the corresponding *real* entity. In a *definition*, a phrase is employed for the exposition of a single word: in a *paraphrasis*, a phrase is employed for the exposition of an entire phrase, of which the word, proposed to be expounded, is made to constitute the principal or characteristic word.

Archetypation (a word employed, for shortness, rather than *archetypophantia*—i. e. indication of the archetype or pattern)—consists in indicating the *material image*, of which the word, taken in its primæval sense, contains the expression.

Thus, without being drawn out into form—(an operation for which a multitude of distinctions and discussions would be found requisite)—in the case of the word *obligation*, both the *paraphrasis* and the *archetypation* may be deduced from what is above.

Rhizophantia—indication of the *root*—might serve as a common or generic term applicable to both.

To return to *analysis*. It is by an operation of the nature of *analysis—primæval* analysis—that the ideas, designated by the several names of *fictitious entities*, have been formed. Unfortunately, in the case of these *fictitious* objects, the description of the way, in which the analysis must, or may have performed, will be matter of much more difficulty, than in the case of the above-mentioned *real* ones.

Not to leave the field of fictitious entities, and with it the corresponding part of the field of *logical analysis*, in the state of an utterly *dark spot*, thus much has here been hazarded: and here it is high time that what has been said on the subject of *analysis* should be brought to a close.

Unfortunately, here are not only *new words*, but these in a multitude, greater by the whole number than would have been employed, could the ideas intended have, at any cheaper rate, been conveyed. But he who, in any branch of art and science, *ethics* itself not excepted, is resolved not to have any thing to do with new words, resolves by that very resolution to confine himself to the existing stock of ideas and opinions, how great soever the degree of incorrectness, imperfection, error, and mischievousness, may in those ideas and opinions happen to be involved.

One parting word in relation to *D'Alembert*: lest, from the indication given in a preceding section (§ 7.) of the imperfections observable in his *Encyclopædical tree*, any unduly unfavourable estimate of the instruction derivable from the philosophical works of that illustrious Frenchman, should be deduced.

With the exception of that which contains the *Encyclopædical tree*, the five volumes of *Miscellanies*, which comprise his *philosophical* works, had not been opened for some thirty or forty years,

when, in expectation of finding in one of them the germ of what has here been said on the subject of *fictitious entities*, it was thought necessary to run over it.

In that particular the search has not been successful. But, in the course of it, ample ground has been seen for the conclusion, that although,—with eyes closed by prudence, or rather by necessity,—treading in the steps of his illustrious precursor, he, on that occasion, kept himself below the level of his own age,—yet, on every succeeding occasion, he may be seen rising high above it.

In the two last of those five volumes are contained applications, successively, and every where more or less successfully made, of the all-comprehending and all-commanding art of Logic, to every subjacent part of the field of art and science.

By a recent but still imperfect review of it, (such as time and eyes would allow of) much regret has been suggested at the thoughts of its never having yet, it is believed, been brought within the reach of the English reader: for, even at the present comparatively advanced period, much useful instruction, as well as, to a comprehensive mind, much gratification, might surely be reaped from a critical perusal of it.

Consummate surely is the originality, the comprehensiveness, the penetration, the discernment, the moderation, the prudence, the elegance of expression, and, amidst surrounding dangers, the steersmanship manifested in that work. It is, for that age, what for the present generation the present work would have endeavoured to render itself, could any such endeavour have found a ray of hope to animate it. Of those volumes, the fourth has for its title, *Essai sur les Elémens de Philosophie, ou sur les principes des Connoissances humaines*: the fifth, under the name of *Eclaircissemens*, &c. contains supplements to some of the principal articles of the preceding Volume. It speaks of itself as having been written at the desire of *Frederic the Great* of *Prussia*. In a translation, the supplements might with advantage, it is believed, be worked up along with the original articles: and prefixt to both might be the contents of the first Volume of the

§ XX. *Proposed new Names—in what cases desirable—in what likely to be employed?*

Among the new names, here proposed for Encyclopedical purposes, are there any, of which it is *desirable* that they should come to be employed for ordinary use?—Among these again, are there any which present any *chance* of their being so employed?

In answer to both these questions, a very few words are all that can be afforded.

Geometry, Arithmetic, Algebra, Fluxions—for fa-

---

five: viz. the preliminary discourse attached to the first French Encyclopedia, and the Preface to the third Volume of that great work.

On the subject of *analysis*, however, the conceptions of *D'Alembert*, (iv. 157, 257, 287, &c.) seem not much more correct than those of *Condillac*. By their manner of speaking of it one would think it was a sort of instrument by which every thing is done. In general the attention paid by men of science to the Greek language, seems not to have been so general in France as in Britain, particularly as in England. Yet even in the Logic of *Saunderson*, who can scarcely be suspected of not being well conversant with Greek, the account given of *analysis* and *synthesis*, (for by him they are both spoken of), has not been found a clear one. By an observation taken of the *archetypal image*, had this use of that operation been sufficiently understood, all this observation might have been prevented. In the case of every name of an *immaterial object*, the *archetype* is at once an *index* and a *holdfast* to the sense of it. In the case of every name of a *fictitious* entity, the only sure test of intellection is *paraphrasis*.

miliar use, what seems as far from being desirable as from being probable, is—that terms, of all which, though only one of them is exactly and originally expressive, the import is so well fixt, should be expelled by new ones.

To *Mathematics*, considered as a branch of art and science, in which all those others are included —to *Mathematics*, howsoever in its original import misexpressive, the same observation may be extended. Not but that *Posology*, should it ever be its lot to come into use, would form a more instructive, and, to all by whom its original import is borne in mind, a more satisfactory name.

Being in their original import so misexpressive,—and, even in respect of present import, one of them at least so indeterminate,—that *Natural History* and *Natural Philosophy* should give way to appellations fixt in their import, in some sort instructive, and at the worst not misexpressive, seems at any rate to be wished. Whether to be looked for seems not equally clear. To a grecianized ear in the first instance, and to an ungrecianized ear when explained to it, *Physiurgic Somatology* and *Anthropurgic Somatology* are expressive,—but then they are not single-worded. *Physiurgics* and *Anthropurgics* are, each of them, when separated from *Somatology*, single-worded. To the use of these, what seems to be the only obstacle—or at any rate the only assignable objection, is—that, being expressive of *accidents* without a *subject*—being

substantives formed out of an adjective without a visible substantive—they might, for some time, fail of being sufficiently *expressive*. In themselves, (not to speak of *Algebra*, which, in its original import is all darkness,) they are, however, in this respect, but upon a par with *Fluxions*. Even *Physiurgic Somatics*, or *Physiurgic Somatology*—*Anthropurgic Somatics*, or *Anthropurgic Somatology*—even these, though, as touching their *two-wordedness*, they are in no *better* case than *Natural History* and *Natural Philosophy*, yet in that respect they are in no *worse* case; and, in respect of *determinateness* and *instructiveness*, they stand in that so much better case, which in Section the fourth, has been brought to view.

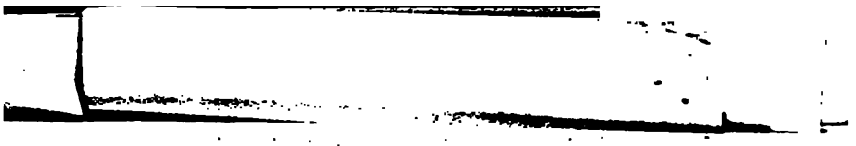
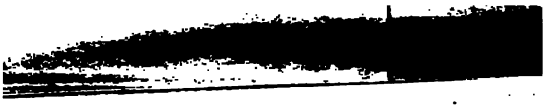
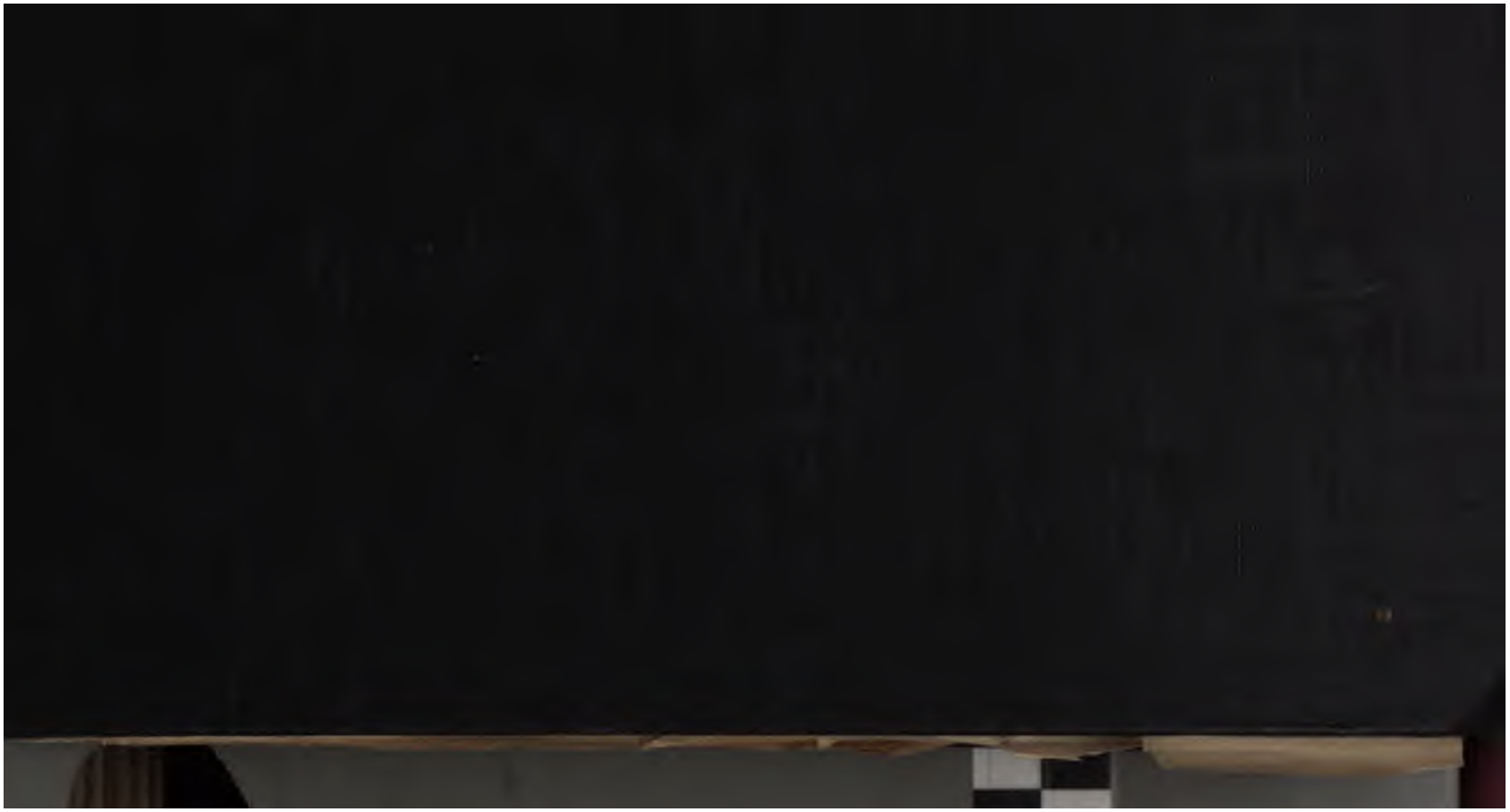
In all these instances, for presenting the import desired—the import for the presentation of which the demand is continually occurring—words, howsoever originally unexpressive or misexpressive, are—and without any very considerable inconvenience—already in universal use. Not so in this case of that branch of *Ethics*, for the designation of which the word *Deontology* has here been ventured to be proposed. Under the undiscriminating import of the word *Ethics*, a branch,—in itself so perfectly distinct,—and which in practice so frequently requires to be distinguished from, and put in opposition to, that which joins with it in forming the two branches of the common trunk,—is at present continually,—and, but for those many-worded explanations,

which are never given, and scarcely ever so much as thought of, irremediably,—confounded.*

---

* Some fourscore years ago, by *David Hume*, in his *Treatise on Human Nature*, the observation was, for the first time, (it is believed) brought to light—how apt men have been, on questions belonging to any part of the field of *Ethics*, to shift backwards and forwards, and apparently without their perceiving it, from the question, what *has been done*, to the question, what *ought to be done*, and *vice versa*: more especially from the former of these points to the other. Some five and forty years ago, on reading that work,—from which, however, in proportion to the bulk of it, no great quantity of useful instruction seemed derivable, that observation presented itself to the writer of these pages, as one of cardinal importance. To every eye, by which those two objects have not been compleatly separated from each other, the whole field of Ethics, in all those divisions of it, which the Table will shew, must ever have been,—yea, and ever will be, a labyrinth without a clue. Such it has been in general, for example, to the writers on *International Law*: witness *Grotius* and *Puffendorf*. In their hands, and apparently without their perceiving it, the question is continually either floating between these two parts of the field of Ethics, or shifting from one to the other. In this state of things, a name, which, such as *Deontology*, turns altogether upon this distinction—suppose any such name to become current, the separation is effectually made, and strong and useful will be the light thus diffused for ever over the whole field. That this distinction should, on every occasion, be clearly perceived is (need it be observed?) the interest of the great bulk of mankind. Unfortunately, this most extensive interest finds opposed to it a cluster of particular interests, which, though so much narrower, being but the more concentrated, have ever been acting against it, with proportionable advantage, and hitherto with irresistible

For exemplification, thu much may perhaps have its use. To examine, ɔ this same view, every new appellative, which the ſable furnishes, would surely be superfluous.

---

effect. One day these particular nterests will be recognized. On the present occasion, to attemɟ bringing them to view would be consistent neither with the unit of the design, nor perhaps, with prudence.